

COMPUTERWORLD

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NEWSPAPER



The Information Management Exposition and Conference opens today in New York. A guide to the show follows Page 74.

As It Adds Four Large Systems... Honeywell 'Unbundles' Software

By CW Staff Writer
WALTHAM, Mass. — Following IBM's lead, Honeywell, Inc. announced last week that it would begin charging users for parts of operating systems it previously supplied without charge.

That announcement came with Honeywell's introduction of four large-scale computer systems. One is said to be twice as powerful as any system Honeywell has yet built, although the firm refused to provide any hard performance figures on the systems.

In addition to the systems and software policy, Honeywell introduced an operating system and live mass storage peripherals and announced an extension of its remote maintenance services.

The change in software policy will affect all large-scale Honeywell users, not just those opting for the new DPS 8 family which includes the DPS 8/20, 8/44, 8/52 and 8/70. The software scheme will begin immediately and apply to all users running GCS III and the newly announced operating system, Gcos 8.

Users will get what is called an Operating System Executive without separate charge. All other operating system elements, "including such system software-dependent components as the Data Management-IV Integrated Transaction Processor" (DM-IV ITP), are to be licensed at a monthly fee. The DM-IV ITP module will cost \$2,000/mo.

That monthly fee, however, covers (Continued on Page 4)

Halon Could Have Saved Census Systems

By Jake Kirchner
CW Washington Bureau
WASHINGTON, D.C. — The U.S. Census Bureau, still reeling from the recent accidental flooding of its central DP room, would be operating at full capacity today if it had relied on Halon instead of water for fire protection.

That was the opinion delivered last week by Air Force Col. Kenneth Smiley Jr. to a meeting here of the federal government's Interagency Committee on Automatic Data Processing.

IBM, Justice Huddle On Antitrust Settlement

By E. Drake Lundell Jr.

WASHINGTON, D.C. — IBM pulled out some heavy legal and political guns here last week as it met with Justice Department officials to discuss a possible settlement of the government's decade-long antitrust suit against the firm.

But prospects for an out-of-court settlement of the case appear dim, even

though U.S. Attorney General Benjamin Civiletti has urged all members of the Justice staff to keep an "open mind" about possible settlement scenarios. Civiletti reportedly would like to settle the matter if IBM will give some ground.

However, political pressures could force an unwanted settlement on Justice. Top Washington insiders Clark Clifford and Paul Warnke accompanied former Attorney General Nicholas deB. Katzenbach, who is now vice-president and general counsel of IBM, to the meeting with top Justice officials.

'Exploratory Talks'

The hour-long meeting was described as the "first exploratory talks that could possibly lead to a settlement." The Justice Department said last week it "anticipates" future meetings, although no dates have been set as yet. IBM would not comment on the meeting, but Justice sources reported that several substantive matters were discussed. They described the meeting as "reasonable and useful."

(Continued on Page 7)

Precursors?

WALTHAM, Mass. — Four mass storage processors — which may actually be embryonic data base processors — were introduced here last week by Honeywell, Inc. along with its four DPS 8 processors.

A disk drive capable of storing up to (Continued on Page 4)

A large turnout at the Oct. 9 meeting illustrated how much interest in bromotrifluoromethane (Halon 1301) has been generated here in the wake of the multimillion dollar Census Bureau DP center flood. The accidental discharge of the center's fire sprinkler system Aug. 8 dumped about 500 gal. of water onto the bureau's CPUs and main memory units [CW, Aug. 13, Oct. 8].

Bruce Ramsey, associate Census Bureau director for DP, presented the meeting with the gory details: Four

Univac mainframes were damaged, two irreparably, which has resulted in "a total loss of all in-house capacity" just as the bureau heads into a "major backload" period in preparation for the 1980 decennial census.

Use of a Halon fire-suppression system, instead of the standard water sprinkler system, would have averted the accident, according to Smiley. "The Census Bureau, if [it] had had Halon, certainly would have experienced

(Continued on Page 6)

The Way to the Top: 'Think Executive'

By Marcy Rosenberg
CW Staff

NEW YORK — Roger Guarino "didn't know the front end from the back end of a computer" when he was asked in 1961 to manage a DP operation at an aerospace engineering company.

Avco Co., however, was not looking for a computer technician; it sought instead someone with strong organizational and managerial skills to take the reins of its Systems and Methods Department. Avco's management thought Guarino, with a degree in industrial engineering and one year's experience running the company's Small Budgets

and Manpower Planning Department, fit the bill. Since that first exposure to DP, Guarino advanced through DP management circles to his cur-

This is another profile in Computerworld's occasional series on DP professionals who climbed the executive ladder by beating the technician image.

rent post as the only executive vice-president of the Federal Home Loan Bank of New York, a po- (Continued on Page 8)



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Editor: E. Drake Lindell Jr.

Managing Editor: Nancy French

Senior Editors:
Software: Donald Levitt
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Communications: Brad Schulte
Features: John C. Whitmarsh

Senior Writers:
Communications: Phil Hirsch

Correspondents:
West Coast: Jeffrey Beiler
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Staff Writers: Marcy Rosenberg
Tom Hensel
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Chief Copy Editor:
Copy Editors: Cheryl M. Galt
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Photography Editor: Ann Donley

Editorial Assistants:
Denise Preski
Martha Taylor

Editorial Cartoonist: Jim Orton

Contributors:
Education: J. Daniel Couger
Taylor Reports: Alan Taylor
Human Connection: Jack Stone

For Sales, Circulation and Production contacts, see inside back page.

Please address all correspondence to the appropriate department at 777 Washington Street, Newton, Mass. 02459. Phone: (617) 949-3000. Telex: 50-973232.

OTHER EDITORIAL OFFICES:

West Coast: 407 California Avenue, Suite 10, Palo Alto, California 94306. Phone: (415) 328-8064.

Washington, D.C.: 621 National Press Building, 529 14th Street N.W., Washington, D.C. 20045. Phone: (202) 347-4718.

England: Steve Burton, IDG Publishing Ltd., 140-146 Camden Street, London N2W 1PT. Phone: 01-267 1201. Telex: 601 264737.

W. Germany: Eckhard Updehl, CW Publikations, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 24-90-41. Telex: 5215350.

Australia: Hideyuma Suzuki, Dempa/Computerworld Agency, Dempa Building, 1-11-13, Higashi Canada 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 448-4101. Telex: J242441.

Australia: John F. Connolly, Computerworld Pty. Ltd., 3 Bruce Street, Crown West, NSW 2055. Phone: 929-5388. Telex: SECCO 2452488.

Brazil: Eric Hippert, Das News, Computermundo do Brasil, Services e Publicacoes Ltda., Rua Alameda Guaranha, 25/10th Floor 20031-Rio de Janeiro, RJ, Brazil. Phone: (21) 242-7395 or 24-0600. Telex: 11-320517(WCRLD BR).

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Burroughs B900 Line Grows Again

DETROIT—Burroughs Corp. last week added another series of mid-range systems to its B900 family. The B1900 series consists of the B1905 entry-level system, the intermediate B1955 and the B1985 dual-processor system.

Initial deliveries of all the systems will begin this year, with volume shipments scheduled to begin in 1980. The B1900 systems are said to do up to 30% more work than the firm's B1800 systems, although they occupy 50% to 65% less floor space, the firm

claimed.

The main memory of the B1905 is expandable to 512K bytes, or twice the capacity previously available in this class of Burroughs system. The memory of the medium-scale B1955 is expandable to 2M bytes, twice the capacity of the B1800 series systems; the performance of this system is approximately 20% higher than that of the B1905, the firm said.

A B1905 system with 131K bytes of memory, 65M bytes of disk storage, a line printer, single-line data communica-

tions control and an operator CRT is priced at \$71,500. It leases for \$2,205/mo.

A B1955 system with 512K bytes of memory, 65M bytes of disk storage, a line printer, multiline data communications control and an operator CRT can be purchased for \$104,000 or leased for \$3,191/mo.

The dual-processor B1985 with 512K bytes of main memory, 130M bytes of disk storage, a line printer, multiline data communications control and an operator CRT costs \$148,960 or \$4,360/mo.

All the processors use an 8K-byte random-access memory (RAM) with an access time of 55 nsec. The processor logic includes simultaneous fetch/execute, which effectively eliminates read access time from the cache, a spokesman claimed.

The central processors use TTL logic and 16K MOS memory technology. Basic cycle time for the B1905 is 250 nsec, while the B1985 has a basic cycle time of 125 nsec. The intermediate B1955 has a basic cycle time of 166 nsec.

The systems use an operating system derived from the company's earlier operating system and enhanced to take advantage of the features of the B1900 systems.

The B1900 runs under an operating system called the Master Control Program Transaction Control System level III (MCP-TCS-III). This operating system, said to incorporate capabilities for both conventional DP and on-line transaction processing, is licensed for a one-time fee of \$7,500 or a monthly fee of \$250.

The two larger systems use the MCP-TCS-IV operating system, which carries a one-time license fee of \$18,000 or a monthly fee of \$600.

GAO Slams SEC for Delay In National Trading System

CW Washington Bureau
WASHINGTON, D.C.—After four years of work, the Securities and Exchange Commission (SEC) is still struggling to develop a national automated securities trading system, according to a recent congressional report.

The General Accounting Office (GAO) reported last month that it could not determine "what progress has been made toward establishing a national market or when the national market will become operational" because the SEC has not developed an overall plan for the system.

The GAO found the commission has so far approved an experimental "fully automated electronic trading system operated by the Cincinatti Stock Exchange. The system 'uses a central computer to match, buy and sell orders.... It is not clear, however, how that system will fit into any future national securities system," the GAO said. In 1975, Congress gave the SEC responsibility for developing the na-

tional system to assure that all buyers and sellers of securities, regardless of their geographic location, would be able to obtain the best prices when trading securities.

The commission has not been able to move more rapidly, the GAO said, because of its small staff and lack of expertise in "sophisticated communications and data processing facilities."

For example, the GAO noted that the Cincinnati exchange's automated system has inadequate safeguards and its computer facility lacks a backup power source. "Anyone could walk into the installation and shut down the system because the main power source switch was unguarded. The operating and backup computers were located side by side in the installation, exposing them to the same risk."

The GAO report recommended that Congress direct the SEC to establish a project team with sufficient technical expertise to develop the national market system within a period of time to be specified by Congress.

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Gcos 8: An 'Evolutionary' Operating System

By a CW Staff Writer
WALTHAM, Mass. — Gos 8, announced last week as Honeywell, Inc.'s latest operating system, is an "evolutionary" outgrowth of Gos systems the firm adopted when it took over General Electric Co.'s computer operations almost 10 years ago.

The communications-oriented Gos 8, which can handle up to 511 concurrent processes (488 of which can be user processes), was designed for the DPS 8 processor's announced last

week. However, it can also be used on certain Level 66/DPS and non-DPS large-scale machines.

All programs written to run under Gos III, including file system, will run under Gos 8, Honeywell said, adding that Gos III will continue to be offered by the firm.

Scheduled for delivery in the third quarter of 1980, Gos 8 can run in eight modes — batch processing, real-time job entry (RJE), interactive RJE, time-sharing, transaction processing,

direct program access, on-line document handling and on-line test and diagnostics. All eight modes can operate concurrently, the firm claimed.

The operating system supports the firm's Distributed Systems environment, used to connect local minicomputers acting as remote processors. It can also permit the interconnection of multiple host systems.

In addition, file transfer facilities for data exchanges are possible.

The Gos 8 transaction processor, the

Data Management-IV Integrated Transaction Processor (DM-IV ITP), can spread a large transaction processing load over several processors, the firm said. DM-IV ITP operates in shared data base control mode so all hardware resources — the real storage and processors — are available to the Transaction Processing Routines (TPR) that make up the transaction processing environment.

The TPRs are programmed in Cobol-74. Existing TPRs need only be recompiled to operate in the new environment, Honeywell said. DM-IV ITP gives each TPR its own domain; each Gos 8 TPR can range up to 1M byte. Segmentation is a key to memory management under Gos 8, a spokesman said. It is accomplished by a combination of hardware and operating system software that is transparent to programmers and users.

The distinction between physical and logical memory is also transparent, the firm said, adding that the maximum physical memory that can be handled is 64M bytes. The maximum logically addressable memory would be 8 trillion bytes.

Hardware extensions along with the latest operating system architecture have considerably enhanced its time-sharing capabilities, Honeywell said. More than 400 concurrent users can be supported and user programs can run up to 1M bytes in size, less the size of the time-sharing executive.

Honeywell 'Unbundles' Operating Systems

(Continued from page 1)

only remote maintenance of the operating system. Users who want on-call service will either have to pay on an individual call basis or get "expanded software support service" ... at a charge that varies by system software product. On the DM-IV ITP, this charge will be \$395, for example.

The system performance analysis facility will carry a monthly software license fee of \$175 and an expanded software support charge of \$25. The software license fee for the software management facility will be \$55/mo plus \$12/mo for support.

For customers using Gos III, "certain selected functions" previously provided without charge as part of the operating system will now be priced separately, Honeywell said. Gos III elements already carrying a separate price will be required to reflect charges of the optional expanded support service. This will apply to anyone ordering Gos III-based systems after Oct. 9 and to all Gos II users after Oct. 1, 1980.

On the hardware side, Honeywell said its latest CPUs will be available in the second quarter of 1980. The firm claimed that the DPS 8/30 and 8/44 compete with the IBM 4300 and that the two larger systems, the 8/52 and 8/70, compete with the IBM Series 30

CPUs, but it refused to release any operating comparisons to back up those claims.

Honeywell also refused to provide ratings of millions of instructions per second (Mips) for the new systems and would not provide figures for average memory access times or basic machine cycle times.

What the firm would say, however, was that the top-of-the-line DPS 8/70 can be configured with four processors and up to 16M bytes of main memory. The processor reportedly breaks no new ground in either logic circuitry or memory technology.

The DPS 8/70 provides twice the power of what had been Honeywell's largest system, the Model 66/80, the firm said. It supports a maximum of 34 I/O multiplexers, four system consoles and eight Datasette 6641 or 6651 front-end network processors.

By contrast, the bottom-of-the-line DPS 8/20 can accommodate a maximum 4M bytes, one system control unit and one I/O multiplexer with 19 channels, the firm said.

The 8/52, which is field-upgradable to the 8/70, has approximately 60% of the power of the larger system. In addition, it is said to have two and a half times the power of the 8/20.

The mid-range DPS 8/44 is said to be 50% more powerful than the 8/20. Although the 8/20 can be field-upgraded

to an 8/44, the 8/44 itself is not field-upgradable, a spokesman explained.

Basic prices for the systems cover the CPU, I/O multiplexer and 1M byte of main memory. They are \$149,048 for the DPS-820, \$225,500 for the 8/44, \$556,691 for the 8/52 and \$1,156,399 for the 8/70.

Monthly rental prices for these systems are \$3,693 for the 8/20, \$5,249 for the 8/44, \$13,020 for the 8/52 and \$26,617 for the 8/70. Additional processors are available for the 8/70 and will sell for \$692,232 or rent for \$20,431/mo.

Except for the smallest system, all the hardware can run under either Gos-III or Gos 8. Programs written for the older operating system will run on the newer one without being recompiled, Honeywell said.

Storage Processors Unveiled

(Continued from Page 1)

1.1 billion 9-bit bytes was also announced.

The four processors — the MSP6064, MSP6067, MSP6068 and MSP6069 — use a microcoded controller program to help boost throughput between the mass storage units on a system and the CPU's I/O multiplexer.

Each processor can perform address conversions, formatting, status report-

ing and collection, transfer routing, test and diagnostic processing, seek overlapping, automatic I/O command retries and alternate track processing the firm said. The use of microcoded instructions for these tasks in the storage processor cuts down overhead in the central system, it pointed out.

The MSP6064 and MSP6067 are single-channel devices; the former is an integrated unit while the latter is free-standing. The MSP6068 and MSP6069 are two-channel devices. The 09 consists of two free-standing modules and the 08 has one free-standing and one integrated module.

Dual-Spindle Disk

The MSU0501 disk is a dual-spindle, fixed-pack storage device with a formatted storage capacity of up to 1.1 billion 9-bit bytes, or 1.65 billion 6-bit characters, Honeywell said. Its peak transfer rate is 1.065 million byte/sec (1.597 million char./sec) and the effective transfer rate is 983,000 byte/sec.

The unit has a rotational positioning feature to reduce channel contention. Its effective latency time is 8.3 msec; Honeywell put the average seek time at 25 msec.

The MSP6064, MSP6067, MSP6068 and MSP6069 cost \$39,000, \$44,000, \$62,500 and \$62,500, respectively, with monthly rentals on a five-year plan set at \$874, \$988, \$1,400 and \$1,400. First customer shipments on the two smaller models will be in the first quarter of 1980; the larger models will be available in the third quarter.

The MSU0501 sells for \$49,450 and rents for \$1,296/mo, the firm said, adding that deliveries of the unit will start immediately.

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WANT-CARD
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Administration Asks Deregulation of Carrier DP

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — The Carrier Administration believes "non-dominant" communications carriers should be allowed to offer data processing and computer-based communication services and equipment directly rather than through separate subsidiaries. It also wants to let AT&T offer such services, but through a fully separate subsidiary that would be subject to limited regulation.

These are two of the key points made by the National Telecommunications and Information Administration (NTIA), the President's chief telecommunications adviser in comments submitted earlier this month to the Federal Communications Commission's (FCC) Computer Inquiry.

By comparison, the FCC has proposed that AT&T and all other "Underlying carriers" be allowed to offer computer-based on-line information services only through separate, regulated subsidiaries.

Underlying carriers include the independent telephone companies, most specialized carriers and Western Union.

DP services could be offered by the subsidiaries on an unregulated basis, according to the FCC proposal. Terminal equipment for the services would be tariffed or not, at the supplier's option.

Bell's Position

There is widespread support — from independent telephone companies, specialized carriers, independent terminal makers and computer services vendors — for requiring greater separation between AT&T and its resale subsidiary than between the other underlying carriers and their subsidiaries, as proposed by NTIA in its Oct. 2 filing. Bell, however, is totally opposed to being treated differently from other telephone companies.

In addition, Bell is willing to accept separate subsidiaries only if the services they offer are totally deregulated and certain other conditions are met. In other words, AT&T is saying that computer-based offerings like its proposed Advanced Communications Service they should be offered directly, not through a subsidiary.

Other Combatants' Stances

The question of the extent to which AT&T's resale entity should be regulated and what services and products it should be allowed to market is the nub of the whole argument in the FCC's inquiry. Where do the other combatants stand on the question?

The Computer and Business Equipment Manufacturers Association (CBEA) agrees with AT&T that enhanced communications services and equipment provided by a Bell resale subsidiary should not be regulated.

Most other computer industry respondents to the Inquiry, together with modem makers and specialized carriers, insist that fully-separate marketing subsidiaries must be established by AT&T for its enhanced nonvoice services and that such subsidiaries must be regulated.

The views of all these groups toward terminal equipment offerings closely parallel their positions regarding services.

The FCC has proposed that "transducers" and "basic media conversion devices" be offered directly by underlying carriers, while terminals that support enhanced nonvoice services be offered by subsidiaries. As the commission put it, "Equipment which performs more than a basic media conversion function may be offered on a tariffed basis only by a resale carrier. Otherwise it must be offered on a non-tariffed basis" through the same or a different subsidiary.

The NTIA would all telephone carriers,

including Bell, to market terminal equipment for enhanced nonvoice services through subsidiaries on a non-tariffed basis.

The Computer and Communications Industry Association (CCIA) wants Bell to be required to set up a separate arm's-length regulated subsidiary to manufacture sophisticated terminal equipment. The FCC has proposed only that such enhanced equipment be marketed by a separate entity.

The association also wants AT&T to provide only voice telephones on a di-

rect basis. The Independent Data Communications Manufacturers Association, the chief trade group of non-Bell modem manufacturers, would go even further by barring underlying carriers from manufacturing or marketing any terminal equipment directly.

The U.S. Independent Telephone Association, however, has argued the FCC can't legally regulate terminal equipment to the same extent it controls services because the former is subject largely to state jurisdiction.

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In U.S. vs. IBM Antitrust Trial

IBM Turns Over Documents, Gets Closed Court

By Connie Winkler
CW Staff

NEW YORK — IBM has finally turned over the first technology and trade secrets documents demanded by the Justice Department in the U.S. vs. IBM antitrust trial, but the courtroom will be closed this week when the documents are used in cross-examination.

"The information would be extremely useful to competitors," IBM head counsel Thomas D. Barr said in asking for the "in camera" — closed court — treatment for the documents.

The documents relate to government questions directed toward Erich Bloch. Bloch is general manager of IBM's East Fishkill, N.Y., semiconductor lab and plant and vice president of the Data Systems Division.

As many as 30 documents of various lengths are involved. IBM says they are either "descriptions of technology of a highly sensitive nature" or documents "sensitive because they contain the most critical kind of business information . . . projected announcements, dates, projected performances, costs."

In urging "in camera" treatment, Barr said it was "a legitimate question"

whether the U.S. Defense Department would allow the disclosure of these documents. Information relating to computer technology is so subject to the control of the Export Control Act; the Secretary of Defense recently stopped the shipment of a Control Data Corp. computer to the Soviet Union, Barr pointed out.

If such a move were necessary, IBM Chairman Frank T. Cary was prepared to testify under oath to the sensitivity of these documents, Barr said.

Frivolity Frowned Upon

Robert J. Staal, head of the Justice Department's trial team, said the government would agree to the procedure

if IBM's claims of confidentiality are not frivolous. The documents must be "reasonably current" and have the " earmarks of confidential information," Staal emphasized.

"We would not agree to it unless there is some reason to believe it is confidential," Staal said.

Judge David N. Edelstein urged that all these confidential Bloch documents be considered together to ensure that the courtroom is not repeatedly opened and closed.

This is the first time IBM has asked for special security arrangements for the handling of documents in the courtroom, although it has argued in numerous legal memoranda — includ-

ing ones on Bloch — that it should not have to turn over trade secret information.

When the government presented its case using documents relating to the National Security Agency of the Department of Commerce, the courtroom was closed.

No End In Sight

This will certainly not be the end of special treatment for IBM documents.

Although on Sept. 17, Barr told the court he was ready to begin producing documents in connection with the testimony of IBM Chairman Frank T. Cary, both sides are still negotiating.

IBM has been fighting the document request since March. The company said the request covers five billion documents and will cost \$1 billion and take 62,000 man-years to produce. Edelstein ruled the documents must be produced to enable the Antitrust Division to cross-examine Cary.

In the negotiations, IBM said it would trade Cary's previous testimony in the Telex, Computer Products, Inc., Memorex Corp. and Transamerica Computer Co. cases for a narrowing of the document list and a time limit for Cary's live cross-examination.

Edelstein is waiting for the Cary document request to be resolved before he considers the equally large government request for documents relating to relief, or the steps that would be taken if IBM were found to be a monopoly.

Halon Could Save DP Site

(Continued from Page 1)

the delays and the cost," he said.

Smiley is responsible for the installation of Halon systems in 120 Air Force Base computer facilities around the world as part of the giant Phase IV program. The \$4 billion Phase IV project, aimed at meeting the needs of the administrative, supply and logistics functions of the base, includes the purchase of 229 computer systems.

Halon, the colorless, odorless, non-conductive gas that has been used commercially for fire suppression for at least 10 years, is "pretty cheap insurance" against the type of catastrophic accident that befell the Census Bureau, Smiley said.

A Halon fire detection and suppression system can be installed for as little as 90 cents per cubic foot of space to be protected, according to Air Force figures. In addition, Smiley said, it offers an impressive array of operational benefits.

- There is no residue after a fire is smothered by Halon. The gas "catches the fire in the incipient stage" — before there is combustion that would lead to soot and smoke.

- The gas can penetrate "nooks and crannies" where water and foam might not reach.
- Personnel safety is more assured than with water, he said, noting that in an ideal fire-fighting system, "you don't mix electricity with water."

- Continuity of operations is more likely. "You don't have the cleanup problems" associated with the secondary damage of water, Ramsey noted that the Census Bureau's cleanup task was aggravated by the "oxides, dust and filth" that was carried out of the sprinkler pipes and gummed up the Univac's innards during the flooding.

According to Smiley, a DP center can be back in operation within 24 hours if a fire is put out with Halon.

While Halon is not recommended for human consumption, the toxicity problem is minimal, Smiley said. Exposure to the gas in the concentrations standard to most systems (5% to 7%) is not considered harmful, although it can lead to drowsiness, light-headedness and disorientation.

In addition, direct exposure to the gas before it combines with the air in the room — a period of about 30 seconds — could result in frostbite.

However, Smiley added, the Air Force systems give 30- to 60-second

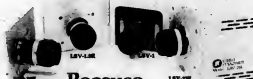
warning before the gas is discharged. This interval allows evacuation of the DP room and gives the security officer the chance to override the system.

The Air Force has recorded about six accidental Halon discharges at its DP facilities this year — blamed on either faulty installation or maintenance — none of which caused any injuries, Smiley reported.

The typical Air Force Halon system is a solid-state, multizone system with battery backup.

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Carter's New Lawyer a Good Friend of IBM

By E. Drake Lundell Jr.

CW Staff

WASHINGTON, D.C. — If IBM seriously wants to settle the antitrust suit the government has filed against it, it has a close friend on its side in the White House — President Carter's new lawyer.

Lloyd Cutler was recently appointed special counsel to the President. Carter's top personal legal adviser is a

man who in the past has tried to help IBM reach a settlement with the Justice Department.

As the President's top legal counsel, Cutler undoubtedly will offer input to discussions on the political and legal ramifications of any settlement — and may be the person with the final word for Carter about possible settlements.

Cutler, who comes from the high-powered Washington law firm of

Wilmer, Cutler and Pickering, aided IBM in 1977, when he set up a meeting between Nicholas deB. Katzenbach, IBM vice president and general counsel, and Donald Baker, then assistant attorney general for antitrust (CW, Jan. 17, 1977). The Cutler firm has a reputation here as a good firm for negotiating settlements between large corporate clients and the government, particularly in the antitrust arena.

The Cutler appointment is just one more example of Carter's penchant for picking high-level IBMers or those with close IBM connections for his inner circle — in spite of the fact that the Justice Department is expending a great deal of resources and effort to prove the firm has been guilty of illegal actions.

Secretary of State Cyrus Vance, Secretary of Defense Harold Brown and Secretary of Health, Education and Welfare Patricia Harris are all former IBM directors. Both former Attorney General Griffin Bell and Carter's close confidante, Charles Kirbo, worked for a law firm that handled IBM business in Georgia.

Commerce Secretary Juanita Kreps (now retiring) was reportedly suggested to the Administration by IBM and was a close friend of Duke University President Terry Sanford, who was once scheduled to testify for IBM in the antitrust case.

In addition, Warren Christopher, who runs the day-to-day operations of the State Department, came from a law firm representing IBM.

IBM, Justice Huddle in D.C.

(Continued from Page 1)

Accompanying Civiletti to the discussions were John H. Shenfield, acting associate attorney general; Donald Flexner and Richard Favretto, deputy assistant attorneys general for antitrust; and Merrick Garland, an assistant to Civiletti.

The presence of Clifford and Warnke on the IBM negotiating team indicate the firm is putting not only legal pressure but also political pressure on the government for a settlement. Clifford — head of the law firm of Clifford, Warnke, Glass, McIlwain and Finney — is almost the archetypal Washington insider and has been a confidante to Democratic politicians for more than 30 years. While normally operating behind the scenes, he served for a time as President Lyndon B. Johnson's Secretary of Defense.

Warnke — a partner in the same law firm — was most recently head of the Arms Control and Disarmament Agency for Carter and served in the Kennedy Administration.

The two, along with Katzenbach, who has kept up his Washington connections while serving his new employer, are members in good standing of the current Democratic power base and are close to both the Kennedy and Carter factions of the party. Those connections may prove useful, because it appears that IBM will not be willing to give as much at the government wants in any consent decree settling the case.

The government has stated before that it would like to have IBM broken up into "several" firms, each of which would be capable of producing an entire range of computer equipment. It said to be holding to that position, although it might be willing to negotiate over the amount of divestiture needed and the exact handling of that divestiture.

However, Katzenbach has said that if the government wants divestiture as part of a settlement, "it has zero chance of success."

The two sides are therefore starting out with diametrically opposed views of what is needed for a settlement in the case — the government pushing for divestiture and IBM adamantly refusing.

Both sides last week that this round of negotiations is the first since the trial of the case started in 1975, but they admitted that serious negotiations on an out-of-court settlement took place before that date.

However, it is known that Katzenbach met with Donald Baker, then in charge of Justice's Antitrust Division, in early 1977. He was accompanied by Lloyd Cutler, a Washington attorney specializing in settlement negotiations (who now holds a White House posi-

tion — see story above).

Katzenbach was apparently rebuffed by Baker, a Republican appointee, since no further meetings were held until now.

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Exec Advises DPer on Way Up

(Continued from Page 1)
sition he has held for more than five years.

There, he oversees the DP operation and a host of user departments. These include the treasurer's office, portfolio management, demand account operations, general accounting, economic research, personnel administration, general services, purchasing and public relations — a total of about 140 employees.

Because Federal Home Loan deals only with other financial institutions and not public accounts, its individual operation sizes are small, although bank assets total some \$4 billion.

With about 40 employees and a budget of approximately \$1.5 million, DP is the largest single department. Using an IBM 370/135 mainframe and 3890 document processor, it serves as the vehicle through which the bank provides cashiers-check and money order services to more than 200 financial institutions.

As his job description indicates, Guarino, unlike many computer industry professionals, has indeed made it to the executive suite — spending time along the way at positions like director of systems and DP for auto parts supplier Kelsey-Hayes Co. in Detroit and vice-president of information systems at American Express Co. here.

Guarino freely admits his entry into the DP field was not planned; he was not a product of technically oriented university or vocational school computer training programs. But like those more technically inclined individuals, he faced a problem during his upward career climb: "I could not uncouple myself from the image of being just a DP guy."

The fact that DPer are often slapped with the label "technician" — and as such cannot easily penetrate the executive ranks of business organizations — has become a familiar thorn in the side of computer professionals. Guarino

would be the first to suggest that this thorn has been planted partly by the individuals themselves.

"Most DP people don't enjoy an easy and facile communication with people in high management positions — and that communications gap is not much better today than it was 10 years ago." He attributes the problem largely to educational philosophies that emphasize the technical side of computing and do not give a broader perspective of the life cycle function of corporations.

Die-Hard

However, many professionals who, like Guarino, migrate to DP from other disciplines or who pick up general management skills some other way frequently find themselves cast into the technician's mold — often because of die-hard attitudes of upper corporate management.

Indeed, what motivated several of Guarino's job changes were expectations on the part of executive superiors that "I keep my place in a technically oriented slot as they perceived it."

Guarino's move to Federal Home Loan was no exception. When word of that executive opening came his way in 1975, he had already entered his fourth year as vice-president of DP operations at a financial institution he preferred not to name.

Guarino's experience in manufacturing and productivity improvement techniques helped him land that job because the hiring executive viewed the firm as a "paper factory" and "visualized me as its vice-president of manufacturing." Once in the position, however, corporate management "looked at and treated me like a technician," so when an accountant friend told him of the executive slot at Federal Home Loan, Guarino seized the opportunity.

That opportunity lifted Guarino out of the DPer-as-technician stereotype, but brought him in touch with the boundaries that role players on fellow



"I could not uncouple myself from the image of being just a DP guy," Guarino recalled.

employees, particularly in the bank's applications programming group.

This department has been suffering from "high turnover" because many of its staffers are oriented to the technical aspects of DP, leaving them little room to advance to the next level of Business systems analyst.

Part of the reason is that Guarino and his vice-president of DP have started to draw a sharp distinction between the two functions. Theoretically, Guarino said, an applications programmer can perform well as a technician "without ever needing to know what application the company is working on or who the user is."

To advance to business systems analyst, the individual will have to show that he is "functionally oriented" — that is, oriented "toward the process of doing business in this company and toward the user's problems." Guarino noted, in fact, that the management of programming "resigned recently," "primarily because I didn't perceived her as growing into a business systems analyst."

Whether the "technician" label is earned by a computer professional or unjustly thrust upon him, Guarino sees a way out if "the DP guy really learns how to think and act the way top-level executives think and act."

Some Advice

How to go about doing that was the subject of a lecture Guarino gave recently at the Wharton School of Business in Philadelphia, where he made the following recommendations:

- Talk plain English — not DP jargon.
- Avoid elegant solutions. "DP people tend to seek a degree of technical perfection that shows they really do not understand the plain brown wrapper system the user manager perceives in his own head, but may not be able to convey."

At Federal Home Loan, for example, "I get polite pressure from the DP department to put everything on-line and in real time when it may not be cost-justified."

- Concentrate on earnings per share. "If I can't find a tangible connection between what benefits a system offers and its value to stockholders, I am suspicious of that system."

• Seek measurable, short-term results. "DPer think in the long term — full implementation of a system in one or two years. But management doesn't have the patience for that."

- Realize that the mission is to install high-level systems, not computers.
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One for Financial Data, One for EFT Administration Offers Two More Privacy Bills

By Jake Kirchner

CW Washington Bureau
WASHINGTON, D.C. — Citing fears of an "Orwellian nightmare" of computers identity compiles dossiers on millions of Americans, U.S. Secretary of Commerce Juanita Kreps has presented major additions to the Carter Administration's privacy initiative.

At a press conference here Oct. 2, Kreps unveiled legislative proposals to protect personal privacy in electronic funds transfer (EFT) transactions and in the collection and dissemination of personal financial information.

The package, which will be submitted to Congress soon, consists of two bills. The first, a comprehensive proposal, covers consumer reporting agencies, credit granters, credit and check authorization agencies, depository institutions and insurance agencies. The second bill calls for protection for EFT messages similar to the safeguards now statutorily guaranteed for telephone conversations and letters.

The proposals, developed by the Commerce Department's National Telecommunications and Information Administration (NTIA) after extensive consultation with industry representatives and government agencies, complement earlier Administration actions to implement the recommendations made in the Privacy Protection Study Commission's final report.

Carter's privacy initiative already includes previously proposed legislation to enhance the confidentiality of medical and research records as well as a number of internal government privacy guidelines. The medical records legislation is currently under active consideration on Capitol Hill.

NTIA officials said last week the Administration is now lining up congressional sponsors for the two latest proposals, which it expects to see introduced in both houses by the end of the month. The House of Representatives and Senate Banking Committees could begin action on the proposals within the next six months, NTIA Head Henry Geller said.

Attempt at Balance

Discussing the legislation, Kreps said the bills are "an outgrowth of the dramatic and fundamental changes in our society that are being fashioned by technology. . . . To ignore the implications of electronic recordkeeping, in which records are both readily centralized and speedily transferred, would be to ignore our long-held precepts on individual privacy."

"And so, while we are still a long way from approaching the Orwellian nightmare that excesses could produce, we must guard against the obvious potential for abuse that the electronic age poses."

The Commerce Secretary said the bills attempt to balance the need for privacy with the "vital" economic need for free flow of information. They "will give persons the right to learn what records on them actually contain; the right to correct or amend those records when they are inaccurate; the right to know who is asking for their records and why; and the right to learn who contributed to the information in their files."

These fair information practices,

coupled with measures to be proposed later to limit government access to personal financial records, constitute the philosophy behind the Administration's latest proposals, the Fair Financial Information Practices Act and the Privacy of Electronic Funds Transfers Act.

Limit Government Access

The NTIA said a bill will be proposed later this year to limit government agency access to insurance and certain credit records. That bill will be modeled on the Right to Financial Privacy Act, signed into law last year; which details steps government agencies must take to obtain personal banking re-

ords.

• Requires financial depository institutions, such as banks, savings and

President Carter espouses voluntary action to safeguard personal privacy, but so far the Administration has offered six legislative proposals designed to enforce compliance. Story on Page 10.

loan associations and credit unions, to notify individuals of their recordkeeping practices. It also regulates disclosure

of individual savings and checking account records.

• Requires insurance companies, agents and insurance support organizations to inform individuals of their recordkeeping practices. The bill would also give individuals access rights to their records and the right to be informed of reasons for adverse decisions about them.

The EFT privacy bill restricts disclosure of transaction information by an EFT service provider to the participants in the transaction or to government agencies with a court order. The bill provides criminal penalties for violations of the act and provides a statutory basis for damage suits.

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Voluntary Privacy: Carter Not Taking Chances?

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Although the Carter Administration espouses reliance on voluntary industry action to safeguard personal privacy, the two new bills it recently proposed (see Page 9) brought to six the number of such bills already introduced — with more to follow.

According to Administration officials, a "reasonable expectation of privacy for all citizens can only be guaranteed by federal law."

Eather Peterson, special assistant to the President for consumer affairs, said Jimmy Carter's privacy legislation program "provides an essential framework for protecting individual privacy. 'We have become a nation which

thrives on information and data," said Peterson, who joined Commerce Secretary Juanita Kreps here to introduce the Fair Financial Information Practices Act and the Privacy of Electronic Funds and Transfers Act.

"Whenever any one of us applies for a loan or credit, seeks medical assistance, undertakes a financial transaction or applies for auto, life or medical insurance, a whole array of computerized data on virtually every aspect of our lives is generated and stored," she noted. Accordingly, the Administration will continue to investigate the need for further privacy legislation.

In the near future, the Department of Health, Education and Welfare will complete a legislative proposal to protect the confidentiality of public assis-

tance and social service records. Legislation may also be needed to protect personnel employee records, according to Administration officials.

Kreps announced that this winter the Department of Labor, "in cooperation with the Commerce Department's Na-

tional Telecommunications and Information Administration, will hold a series of regional public hearings to examine industry's progress in responding to the President's call for voluntary efforts to protect the privacy of employee records."

Interns Help Service Bureau Handle Short-Term Backlog

By Tom Henkel

CW Staff

DECATUR, Ga. — A backlog of programming tasks last summer and a nearby Control Data Corp. programming school gave a service bureau here

an idea — why not start an internship program? So Careerdecatur, Inc. asked CDC's school to send over some novice programmers who would be paid for their services.

"We took six interns — which proved to be too many. When we got it down to four, it worked real well," Steve Joiner, Careerdecatur's systems and programming officer, said.

"We just brought them into the staff and treated them like one of the group. We taught them as much as we could on how to use our on-line system. We also had to teach them the characteristics of Burroughs Corp. Cobol (the five users dual Burroughs B4700 CPUs), which really didn't apply to what they'd been learning," Joiner said.

The firm used two of the novice programmers to help develop a marketing package for software it was planning to sell. The other two programmers did minor software maintenance jobs.

"We didn't give them projects of major importance; that wouldn't be too bright. But it gave them some real world experience. They were subject to the same pressures and deadlines as anyone else on the staff. It's experience they couldn't get in school and it showed us what they can do."

Correspondent, the service house for nine savings and loan associations around Atlanta, got one full-time programmer out of the deal. Another student programmer was referred by the firm to a local installation also using Burroughs hardware.

"The problem [with the internship program] is that it's time-consuming for management and the other staff members if [the interns] require a considerable amount of attention. The ones who showed they could work on their own, we kept. The ones who required a lot of time, we discontinued their services. Some lasted a few weeks while others lasted several months," Joiner recalled.

"I'm sure we'll do it again," he added, but he wasn't sure when. "We understand some organizational changes and we established a marketing business. We needed help and we had a backlog at the time, and we didn't have the budget for it," he explained. "Summer is a good time for interns because [regular staffers] take vacations then."

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Citibank Starts 273-Branch 'Universal Teller'

By Marguerite Zientara

CW Staff

NEW YORK — In an effort to improve teller productivity — and with the added benefit of better security — Citibank will have a minicomputer-based "universal teller system" in its 273 branches by the end of 1981.

The system, from Data Saab U.S., will supply every teller in every branch with a CRT terminal and a shared printer and cash-dispensing machine. Minicomputers at the branches control up to 24 terminals each, according to Gary Judd, Citibank vice-president, and the cash dispenser has a "cash adapter" mechanism that tracks how much cash each teller has received.

The system is currently installed in 14 Citibank branches in lower Manhattan; four more were scheduled to go in last week. A total of 35 branches in lower Manhattan will be outfitted with the system by mid-December.

While tellers still have a cash drawer for incoming cash transactions and for making change, all outgoing cash comes from the automated cash dispenser. Since the bank's most frequent type of transaction is paying out cash, the system substantially reduces the amount of cash a teller must maintain in the cash drawer.

To make a transaction, a customer can give a teller his plastic bank card or a teller can key in the customer's account number. Each method yields the same result, but the use of the card speeds up any transaction because of the efficiency of the "magic metal reader" used by the bank, Judd observed.

Teller Productivity Aid

The bank is installing the system, which has been under development for four years, at a time when bank robberies in New York City are at an all-time high. While the system "is helping on that" because of reduced cash in cash drawers, according to Judd, it was originally planned to improve teller productivity and shorten customer waiting lines.

For example, the system allows any teller to handle any and every type of bank transaction. Previously, special tellers handled specific transactions, such as traveler's checks, savings

bonds and savings accounts.

The system especially improves the efficiency of check-cashing operations, Judd said. "Whereas in the past a teller had to go through a series of steps and then handle a reasonable amount of cash, now the teller very quickly uses the CRT to access the cash," he explained.

Traditionally, tellers count money to be given to a customer "one, two or three times," he noted, a task the system has eliminated. Now "they simply give the customer the money" directly from the machine.

As for machine-made mistakes — the "misdispense rate" — it is lower with Citibank's system than "any automa-

ted dispensing device that we know of," Judd said. While acknowledging that the machine "does make a mistake occasionally," he contended it is "much more accurate than tellers."

Furthermore, the operation "significantly reduces the end-of-day proving time for a teller, which is a lot of the nitty-gritty of the teller world," according to Judd. An automated proof mechanism, which tallies the teller's daily accounts, can save up to 90 minutes per teller per day, he claimed.

'Normal' Problems

Things are running very smoothly, Judd said. The only problems have been "the normal things we would ex-

pect," such as the initial mortality on some chips and the "occasional software bug that takes two days to change — but no show-stoppers by any means."

"The complexity of the interaction between the cash adapter and the teller's keyboard and microprocessor is one that has never been done before," he explained, noting that that is the root of the "very minor" software bugs.

The system, whose total value is confidential, is based on Data Saab's D-16 minicomputer with 128K bytes of memory, Model 350016 keyboards and Model 350085 keyboards and Model 35008 printers.

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'Do You Ever Get The Feeling It's Not Telling Us All It Knows?'

Turnout at Spectrum Users Group Up 25%

By Jeffrey Beeler

CW West Coast Bureau
BERKELEY, Calif. — Despite dramatic advances in hardware technology, the need for effective project management methodologies remains as acute as ever. In fact, if anything, the demand for such methodologies has grown in recent years, as the brief history of the Spectrum International, Inc. users group meeting attests.

When Spectrum, a Los Angeles-based supplier of project management and system development methodologies manuals, held its first users group meeting in 1976, a scant 30 visitors attended.

This year's gathering, by contrast, attracted about 150 attendees, some of them from as far away as South Africa, Australia and The Netherlands. The turnout, which represented a 25% increase over last year's attendance, included representatives from about 70 user organizations, or almost 70% of Spectrum's worldwide customer base.

Spectrum officials partly attributed the rising attendance to growing user interest in project management and system development methodologies. DPMs have realized, officials said, that even though technological breakthroughs and improved break-performance have put upgraded computing tools at their disposal, they still need effective management philosophies to use those tools efficiently.

Four Speak Out

Several factors have contributed to the mounting user concern with project management methodologies. To explore some of those factors, *Computerworld* sought the opinions of four DPMs at Spectrum's latest user group meeting here.

The four included Gerald Friedrich, project coordinator for the Northwestern National Insurance Group; Richard Dohrmann, manager of systems quality information services at Green Giant Co.; Robert Bruner of PPG Industries, Inc.'s information systems department; and Karen Lauffer, project control administrator for Phillips Petroleum Corp.

Although the four users represent widely differing industries, they all agreed a scarcity of computing resources has contributed to the growing need for effective project management. Today's typical DP center, Dohrmann said, is so often called upon to complete many more projects than its limited staff or computing resources can accommodate. Because users are frequently unable to tackle all their workload at once, they're forced to develop the most important projects first and save the less urgent ones for later.

An effective project-management methodology can help users set priorities for various jobs, although it should never be used as a substitute for sound decision making, Dohrmann said.

Another problem that has fed the strong user interest in project management is the lack of standardized reporting procedures, Friedrich added. At many computing sites, the format for presenting management information to its users varies widely from report to report.

As a result, "many user departments often spend a lot of their time simply

trying to figure out what [their DP centers' reports] are trying to tell them," Friedrich said. Bruner agreed, and likened the problem to a modern "Tower of Babel."

Standardization Can Help

Effective project management, however, can help eliminate much of this inconsistency and confusion by standardizing a DP center's reporting procedures. "A good methodology forces you to create documentation, put it down on paper and then follow it,"

Dohrmann explained.

It also often leads DP departments to develop standard ways of doing business. Such standards help newly hired personnel to quickly learn their predecessors' methods of operation, and thus allow computing sites to preserve continuity during periods of staff change, Dohrmann added.

A third problem that has intensified user interest in project management is the growing shortage of skilled DP personnel. At most computing sites, staff "turnover is tremendous, and re-

placements simply aren't available," Friedrich complained. "As a result, most new recruits come straight out of college, and you have to train them."

Training Necessary

To make matters worse, even if qualified programmers and systems analysts do become available, they still need training to become effective project managers. "You have to mold their basic skills into management abilities that are really of value in a DP environment," Dohrmann said.

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Bar Codes Help Score Boston Bonne Bell Race

By Howard A. Karsen
CW Staff

BOSTON — Accompanied by a bright October sun, gusty winds and a Honeywell, Inc. computer that scored the results, more than 5,035 women competed here last week in the 1979 national championship Bonne Bell

10,000-meter race.

This year's race — the third annual event — saw two Bonne Bell firsts: the setting of a record time of 32 minutes and 47 seconds by winner Margaret Groos and the use of bar codes to score all participants.

The system recording and printing

out the data was a Honeywell, Inc. Level 6 Model 57 minicomputer with 256K bytes of memory. Supported by two 80M-byte disks, six Honeywell VIP 7200 CRT terminals, two Computer Identics Corp. bar code readers and two 300 line/min. printers, the computer began printing out results literally minutes after each racer crossed the finish line.

Runner's IDs Unique

Each runner was given a unique bar-coded tag, which was attached to her number. As the racers approached the finish line, they were channeled into separate lanes. At the same time, scorers standing at the van containing the computer equipment pressed a button to indicate an "event." The computer recorded the time and se-

quence of each event.

The bar-coded tags were placed on a ring behind a batch header. The push of a button signalled the moment when the first of a group of runners entered a lane.

The tickets, placed on the ring in the order in which the racers entered the chute, were brought to the van, where two people armed with light pens scanned each header and tag. The numbers on the coded tags were then associated with the name and other data on each runner and the results printed out in the order in which the racers finished.

This setup is not economical for every situation, Honeywell officials explained. More than 2,500 runners should be entered in a race to justify use of this system, officials noted.

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System Trains for Olympics At Figure Skating Meet

By A CW Staff Writer
LAKE PLACID, N.Y. — More than 60 athletes as well as a computer-based scoring system had a preview of the upcoming U.S. Winter Olympics recently during the three-day Norton International Figure Skating Competition.

As the skaters skinned through intricate ice dancing routines highlighted by double and triple jumps, nine Olympic judges recorded their moves. The scores were then entered into a Texas Instruments, Inc. Silent 700 Model 745 data terminal at the arena and transmitted via telephone to one of two TI DS 990 host minicomputers lo-

gled, respectively.

Kristina Ragoecy and Andras Salay from Budapest, Hungary, dominated the Ice Dancing event, and Savine Baes and Tassilo Thierbach of the German Democratic Republic won in the Pairs division, the spokesman noted.

The ice skating competition itself, nicknamed the Norton Skate, was billed as the official test event for Lake Placid's new ice center and marked the first time that TI used its System for Computerized Olympic Results and Events (TI-Score) in a decentralized mode.

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Judged with the help of minicomputers, Scott Hamilton skates his way to a gold medal at the Norton Skating Competition in Lake Placid, N.Y.

cated in the Lake Placid town hall.

The dual computer system processed the skaters' scores and transmitted them back to the TI terminal, while at the same time the event's results were printed on a series of Omni 800 Model 830 terminals positioned at various press centers throughout the Olympic complex, a spokesman said.

As the final results were tallied, the capacity crowd learned that the Americans had captured two first-place awards in the four-category competition. Scott Hamilton of Bowling Green, Ohio, and Lisa-Marie Allen of Garden Grove, Calif., won top honors in the Men's Singles and Ladies' Sin-

Designed specifically for the 1980 Winter Games, the system consists of a network of 29 Model 771 intelligent terminals, nine Model 820 data terminals and 10 Model 745/765 portable terminals. All the equipment is interactively linked to the DS 990 machines, which not only tabulate scores, but provide athletic profiles, starting lists and support reservations and accreditation for the Olympic Village, the spokesman pointed out.

Within 24 hours of the completion of the Olympics, the scoring system will reportedly supply the final results of all the games for use in an official "Results Book."

Boy Sees Explosion Doing the Hustle

Ruth Schiff Winett

Sentences with dangling modifiers, such as the one used in the headline, are a good source of comic relief for harried editors and teachers of composition. A dangling modifier is a group

This is the third in a series of 12 articles on better writing.

of words whose connection with the rest of the sentence is ambiguous.

Usually a dangling modifier is a phrase; not a clause, since it lacks either a subject, a verb or both. Sentences with dangling modifiers are like improperly wired electrical circuits. Unless the wiring or sentence problems are corrected, the circuit and the sentence will not be complete.

How do writers revise sentences such as, "Waiting for the computer to come back up, ping-pong was played?"

Basically, there are two remedies. Writers should ask, "Who or what did what?" If the sentence lacks a subject and/or a verb, writers should provide whichever sentence part is missing.

In addition, they should place modifiers — words or groups of words which explain or comment on other words in a sentence — close to the words being modified. The reason this must be done is that the brain automatically closes the circuit and links modifiers with the nearest noun, regardless of whether the resulting statement makes sense.

Example 1: I saw a disconnected cable walking into the computer room.

Remedy: Walking into the computer room, I saw a disconnected cable. (The first sentence is more interesting, but the second is more logical since the modifier — the phrase — is close to the word being modified.)

Example 2: Listening to computer-generated music, his head hurt.

Remedy: While he was listening to computer-generated music, his head hurt. (No wonder!)

Three types of dangling modifiers are dangling participle phrases, gerund phrases and infinitive phrases. A participle is a verb plus "-ing" which is used as an adjective ("boring"); a gerund is a verb plus "-ing" which is used as a noun ("testing"); and an infinitive is "to" plus a verb which is used as a noun, adjective or adverb ("to bore"). Here are some participle phrases.

Example 3: She saw her boss debugging her program.

Remedy A: She saw her boss when she was debugging her program.

Remedy B: She saw her boss, who was debugging her program.

Example 4: The computer broke down while testing the program.

Remedy: The computer broke down while the programmer was testing the program.



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gram.

And here are some examples of dangling gerunds:

Example 5: In comparing computer languages, Cobol is more suitable for business applications.

Remedy: When they compared computer languages, they found Cobol is more suitable for business applications. (In the first sentence, Cobol seems to be making the comparisons. However, there are some things even Cobol can't do.)

Example 7: Conflict was avoided by assigning jobs to the programmers. (Who or what is assigning the jobs?)

Remedy: By assigning jobs to the programmers, we avoided conflict.

Example 8: By documenting the program, it was more maintainable.

Remedy: By documenting the program, he made it more maintainable. (A subject has been added.)

Finally, here are some examples of dangling infinitives.

Example 9: Not able to write proposals, contracts were lost.

Remedy: Because we were unable to write proposals, we lost contracts.

Example 10: To write proposals, special skills are required.

Remedy: To write proposals, one must possess special skills. (The infinitive phrase "to write proposals" is placed next to "one," the writer of the proposals. The passive construction "is required" is changed to an active construction, "one must possess.")

Example 11: Because of the need to practice for perfection in timing, canned music is best.

Remedy: Using recorded music during practice helps me perfect my timing. (This sentence needs major surgery! The meaning of the original sentence is unclear because the first phrase "because of the need ... in timing" has no real subject. Since the phrase is juxtaposed with "canned music," "canned music" would seem to be the subject of the phrase. The word "recorded" is substituted for "canned" for the sake of clarity.)

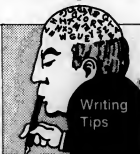
In sentences with correctly written participle, gerund or infinitive phrases, a comma separates the modifying phrase from the rest of the sentence.

Besides these, three dangling constructions, there is a fourth type of dangling modifier: a dangling elliptical adverb. An elliptical construction is one in which words are implied, not stated.

This type of construction is also considered an adverb phrase because it answers "why?" "when?" "where?" or "how?"

Example 12: When asked to work the second shift, nobody volunteered.

Remedy: When the programmers were asked to work the second shift, nobody vol-



unteered. (A subject and a verb have been added.)

Example 13: Although only down a short time, a tremendous backlog developed.

Remedy: Although the computer was down only a short time, a tremendous backlog developed. (A subject has been supplied.)

Example 14: By budgeting time, the im-

portant programming jobs get done.

Remedy: If one budgets his time, he can do the important programming jobs. (A subject has been added, and the passive construction has been replaced.)

Dangling modifiers and other grammar and composition questions are discussed in the *Handbook* by John C. Hodges and Mary E. Whitten (New York: Harcourt Brace Jovanovich, 1977).

For the sake of clarity, writers should studiously avoid dangling constructions. They should keep modifying phrases close to the noun being modified, and they should supply subjects and verbs wherever they are needed.

Thus, the corrected headline is: "The boy doing the hustle sees an explosion."

Winett teaches "Essentials of Writing" at Framingham (Mass.) State College.



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DP Veteran Aids Fledglings CDC Opens Services Center for New Businesses

By Tom Henkel
CW Staff

ST. PAUL, Minn. — What was once a crumbling office building has been renovated by Control Data Corp. — one of the DP "veterans" — to house a full line of business and DP services for newcomers to the industry.

Dubbed the Business and Technology Center, CDC's establishment opened here in July. Fifteen more centers are planned for sites elsewhere in Minnesota and in Toledo, Ohio, and Philadelphia over the next five years.

Intended mainly for fledgling technical firms, the centers are open to anyone willing to pay the monthly rent of

\$6.95/sq ft. Rent payments entitle center tenants to access CDC's Cybernet and Technotech services, as well as servicing bureau-type DP services including payroll, accounts receivable, sales analysis, accounts payable and general ledger accounting. Users also have access to CDC's Plato, a computer-assisted instruction system.

Also available in the centers are laboratory space, conference rooms, secretarial support, copying facilities, a switchboard and a business library.

"Some are big enough to use the batch bookkeeping where you feed in the data and get the printouts sent back to you. It depends on size," ac-

cording to Dick Muller, CDC's technical services manager.

If companies decide they need specialized programs, in some cases CDC will aid in software development. "If you develop it yourself, then it's yours. You buy the raw machine time on Cybernet."

Equipped With Minis

In addition to the large time-sharing system, the center is also equipped with a series of minicomputers to do smaller jobs. "We have a Cyber 18, an Apple Computer, Inc. II and we have access to a Wang Laboratories, Inc. system with some business intelli-

gence. We're also looking at CPT Corp., which makes some time word processing systems with some computing power," Muller said.

Each center will be equipped with at least one minicomputer and a group of portable terminals to access it.

"If you use one of the minis in the center, you schedule some time on it. It's a first come, first served deal. We use Plato with a lesson called 'Schedule' to distribute the computer time, Muller said.

Even after time has been scheduled, it is not hard-and-fast. "If you had a priority and someone else was [using the system], in most cases you could negotiate a deal to change times," Muller explained.

In addition to computer services, each center offers initial space design; basic utilities, daily maintenance and cleaning, a building receptionist, a security system and use of conference rooms, according to CDC.

Optional equipment that can be incorporated into the centers includes compressed air lines, extended venting and plumbing, vacuum lines, de-ionized water and a source for chilled water or steam, CDC said.

Turning a Profit

Although dealing with fledgling businesses may sound like a shaky business venture, Muller said CDC is turning a profit on the deal.

"Our job is to do our best to help them succeed. If it means carrying them for a few months, that's not the worst thing in the world — but that has not happened." To date, all the tenants at the St. Paul center have been paying their rent punctually, Muller said.

Aside from a helping hand with business services, CDC business experts offer advice to new business people. "People come in with ideas and we tell them flat out, 'If you don't have skills or resources to do it, we recommend that you don't,'" Muller said.

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James Martin Gets Acpa Award

KENSINGTON, Md. — Author, lecturer and educator James Martin has been selected by the Association of Computer Programmers and Analysts (Acpa) to receive its Fellow Award for "his outstanding efforts to increase the level of educational and professional excellence in the field of information processing."

Acpa's Professional Service Award will go to J. Daniel Couger, author, lecturer and professor of computer and management science at the University of Colorado.

Martin, formerly with IBM, is currently presenting a series of seminars sponsored by Technology Transfer Institute of Los Angeles. The award will be presented to him Oct. 15 in Washington, D.C., at his first fall seminar.

Couger has devoted much of his career to the educational and professional development of computer practitioners. Acpa president Robert L. White noted. The award will be presented to Couger at the Acpa National Conference Oct. 22 in Washington, D.C.



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page and feast your eyes on the many advantages this high level, general-purpose language has to offer, you'll see why that's very good news indeed.



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If you'd like to let the world know who speaks Pascal, here's how:

Preheat iron (dry-wool setting) for 3 minutes. Slip garment on ironing board over scrap material. Remove wrinkles. Position transfer face down and pin edges to ironing board cover. Iron transfer slowly for one minute. If paper browns, iron is

too hot. Let transfer cool for one minute, then unpin and slowly pull transfer straight up. Results are best when t-shirt is at least 50% polyester.

Pascal by the package.

Our high-level, full feature Language System consists of a plug-in 16K RAM language card, five diskettes containing Pascal as well as Integer BASIC and Applesoft extended BASIC, plus seven manuals documenting the three languages.

The beauty of this Language System is that it speeds up execution and helps cut unwieldy software development jobs down to size. Also, because the languages are on diskette, loaded into RAM, you can quickly and economically take advantage of upgrades and new languages as they're introduced.

Apple's Pascal language takes full advantage of Apple high resolution and color graphics, analog input and sound generation capabilities. It turns the Apple into the lowest priced, highest powered Pascal system on the market.

With Pascal, programs can be written, debugged and executed in just one-third the time required for equivalent BASIC programs. With just one-third the memory.

On top of that, Pascal is easy to understand, elegant and able to handle advanced applications. It allows one programmer to pick up where another left off with minimal chance of foul up.

And, because Apple uses the UCSD Pascal standard, you're guaranteed to get the most comprehensive version available—and one that can be used on any computer that runs Pascal, no matter what the size. Which is really something an enthusiast can get enthused about.

To be more specific.

The Apple II's specs are tempting enough without the Language System and Pascal. With them, they're downright irresistible.

The text, normally displayed as 24 lines of 40 characters each, expands to 80 characters thanks to the use of horizontal scrolling.

Characters are normal, inverse or flashing, 5 x 7, upper case. Full cursor control is standard.

Since Pascal runs on an Apple computer with 48K bytes of on-board RAM, the additional 16K bytes on the language card bring the total to a full 64K bytes.

And, Pascal runs on the new Apple II Plus. It features an Auto-Start ROM that boots the Disk II at power-on for turn-key operation. Applesoft extended BASIC is resident in ROM.

Standard color graphics offer 40h x 48v resolution, or 40h x 40v with 4 lines text, in fifteen colors.

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- 41 Application Engineer
- 42 Other Engineering
- 51 Mfg Sales Representative
- 52 Other Sales/Marketing
- 60 Consultant
- 70 Lawyer/Accountant
- 80 Librarian/Educator/Student

Managers on the Move.

ANDREW TASSANI has been named special projects manager of the Data Processing Division at Panasonic Co. in Secaucus, N.J.

Tassani will be responsible for the implementation of large-scale projects, such as order entry systems for the Panasonic Consumer Electronics Group and Consumer Parts Division. Tassani joined Panasonic in 1970 as a programmer/analyst. Since then, he has held the positions of programming supervisor and systems and programming manager.



Andrew Tassani

MICHAEL S. SHER has been named deputy director of the Information Sciences Directorate of the Idaho National Engineering Laboratory in Idaho Falls.

Sher will be responsible for planning, resource acquisition, systems design

and operation of both central and distributed processing facilities at the laboratory.

A former research assistant professor in the Computer Science Department at the University of Illinois, Sher participated in the Illiac IV project. He also served as associate director of the Center for Advanced Computation.

Sher holds a B.A. degree in physics from Washington University, an M.S. degree in atmospheric science from the University of Missouri at Columbia and a Ph.D. in nuclear physics from Michigan State University.



Michael S. Sher

GENE R. DEKOSTER has been named a senior vice-president and director of the Technical Support Group

of Western Bancorp Data Processing Co., an affiliate of Western Bancorporation, in Torrance, Calif.

Prior to joining Western Bancorp, DeKoster held a management position with IBM in Palo Alto, Calif.

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programmability; an integral microprocessor; PROM resident software; protected format; numeric pad and lower case.

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*Formerly the Omron K8081/UNET. UNISCOP is a registered trademark of the Sorey Univac Corporation.

THOMAS D. CASH Jr. has been named corporate director of data processing at Cannon Mills Co. in Kannapolis, N.C.

(Continued on Page 21)

Hard Times Seen For Data Entry

By Howard A. Korten.

CW Staff

NEW ORLEANS—Slower economic growth. Higher inflation rates. A significant squeeze in the available labor supply. A bullish stock market, fueled by pent-up industrial demand.

These are some of the scenarios we can expect to see in the coming decade, according to Bruce J. Wright, keynote speaker at the third annual conference of the Data Entry Management Association (DEMA) here last week. Drawing from what he called his own crystal ball, as well as from the predictions of economists and a recent study conducted by his own firm, the president of Wright Associates, Ltd. in Salt Lake City, Utah, drew a disturbing and at times seemingly contradictory picture of the economy of the future, particularly as it would affect the large gathering of data entry managers.

Wright appeared to be exempting DP generally, and data entry particularly, from this bleak picture. In any case, however, data entry managers will have to become better managers, he noted. The economic environment will be more competitive, especially in data entry.

Although Wright holds an M.B.A. degree, he is not an economist. However, he has an extensive background in DP and has been honored by the American Management Associations.

The expected economic growth "will reveal some socioeconomic problems, including some we haven't faced before," he said. In particular, the period from 1981 to 1985 will see a spending boom that will shift the economy from a labor- and energy-intensive economy to a machine-intensive one, partly to save energy.

"Be agents of change and growth," he exhorted attendees. "The years of growth for data entry will truly be the 1980s. But whether we lead the parade, or clean up after the horses, is up to us."

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Managers on the Move

(Continued from Page 20)

Previously, Cash served as director of management information services and administration at Text Industries in Greensboro. He also worked as an internal consultant with Text in 1973-1976.

Cash attended North Carolina State University and Wake Forest University, where he received a B.S. in physics. He also holds an M.S. in operations research from Georgia Tech.

JOHN BRIDGES has been appointed director of business applications at Telco Research Corp. in Nashville, Tenn.

Bridges will work closely with Telco's network clients and will conduct Telco seminars.

He joined Telco Research Corp. following five years experience with AT&T, where his responsibilities in-

cluded working with CCSA, EPSCS and Dimension ETN customers.



John Bridges

Bridges holds master's degrees in both mathematics and computer science from Pennsylvania State University.

GEORGE B. TWARDZIK has been named vice-president of corporate data processing at Alexander & Alexander in Baltimore, Md.

Twardzik was most recently vice-president of information services for After Six, Inc. in Philadelphia. Prior to that, he served as director of information systems for Londontown Corp. in Baltimore.

He is a graduate of Hofstra University.

DR. MARSHALL C. YOVITS has been appointed dean of the Purdue University School of Science at Indiana University-Purdue University at Indianapolis, effective Jan. 1.

He is currently professor of computer and information science and professor of electrical engineering at Ohio State University.

Yovits holds B.S. and M.S. degrees in physics from Union College and an M.S. and Ph.D. in physics from Yale University.

ROGELIO L. ARGUELLES has been named manager of applications development in information systems and planning at National Central Bank in

London, Pa. Arguelles most recently worked as a private consultant on DP and information systems. He has served the government of Peru as director of general informatics for the Ministry of Economy and Finance and as director of the computer center of the Peruvian Navy. Arguelles holds an M.S. degree in computer systems management from the U.S. Naval Post Graduate School in Monterey, Calif. He has also attended Harvard University Graduate School of Business.

PAUL STIEMAN has been appointed director of the computer center at the University of Pittsburgh.

Stiemann joined the university in July



Gene R. DeKoster

1978, first as associate director of the computer center and more recently as acting director. Prior to joining the

university, he was director of computer services and professor of mathematics at Slippery Rock State College.

Stiemann holds a B.S. in mathematics from Slippery Rock State College and master's and doctorate degrees in educational research from the University of Pittsburgh.

PAUL D. FRANKIE has been named a manager in Price Waterhouse & Co.'s Management Advisory Services Department in Pittsburgh.

Frankie holds a B.S. degree in administration and management science from Carnegie-Mellon University.

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Mini Helps Testing Center Evaluate Price/Performance Of Solar Energy Devices

By Joseph F. Kelley

Special to CW

CAPE CANAVERAL, Fla. — In an effort to gather information on the efficiency of various brands of solar energy devices, the Florida Solar Energy Testing Center has enlisted the aid of a computer. The center was set up by an act of the Florida legislature in 1976 for the purpose of establishing standards for evaluating solar equipment.

The information the group makes available should help prospective buyers determine whether hot water heating or electricity-producing solar devices represent the best price/performance trade-off.

Though measurement of photovoltaic devices — devices that turn sunlight into electricity — will take place sometime in the near future, the research station has been measuring flat plate collectors for a few years with the aid of a Digital Equipment Corp. PDP-11/34 and has developed a rating

curve for each collector.

The collected data could then be printed out in final form and the efficiency curves transferred to a Tektronix, Inc. 4051 graphics system. The system was updated recently to include the use of microprocessors to spend data collection.

The micros can monitor and take care of the most troublesome testing procedures, including the measurement of the flow rates of the flat plate collectors, according to Thomason. The center also improved its ability to gather and use data by moving from DEC's RT-11 single-user operating system to its RSX real-time sharing system.

The center recently adapted to a new testing standard developed by the American Society of Heating and Cooling Engineers. Each collector is rated for three temperature ranges, low, medium and high, and the number of BTUs collected each day by a particular unit is then determined.



Flat plate collectors, which heat liquids with the help of sunlight, soak up the rays outside the Florida Solar Energy Testing Center.

system for them. Flat plate collectors are rooftop units that use sunlight to heat liquids.

To test the efficiency of the flat plate collectors, test stands were erected, and the heat gains were recorded in British Thermal Units (BTUs). Such a project had never before been undertaken on such a complete scale, according to Bob Thomason, senior programmer at the energy center.

Some of the factors affecting the test results were the gross surface area of the unit, the degree of tilt toward the sun, the time of year of the test, the air temperature and the extent of the cloud cover.

Testing Process

The cost of manually collecting this data and applying it to a predetermined formula to rate the collectors would have been prohibitive. Florida's answer was to purchase the DEC mini-computer.

Information from the collectors being tested was first inscribed into a data logger and then transposed onto tapes. Data was then processed and the results stored on disk. After a sufficient number of test points were gathered, the group was able to produce an effi-

ciency curve for each collector. The center does not rank the collectors, but the test results are set up so that consumers can easily find the right collector for their purposes. If one collector is twice as efficient as another but costs five times as much, it might be more economical to buy two of the less efficient collectors if there is enough space available, Thomason indicated.

Government Backing

In Florida, more than 20,000 solar hot water heaters are now in use, saving fossil fuel energy. The U.S. government has encouraged the use of the heaters by distributing grants through the Department of Housing and Urban Development.

Most users of solar water heaters can recover the cost in four to six years; after that point, the hot water is free.

The center has completed a house that receives all its energy from the sun — some of it through the use of photovoltaic plates. The heating for the houses is controlled and monitored by the minicomputer. Simulations for experimental solar energy systems and photovoltaic testing procedures are in the works.

Supports 'Concept' of U.S. Commission Afips Backs Proposed Study of DP in Education

By Jay Woodruff

CW Staff

WASHINGTON, D.C. — The concept of a proposed congressional commission to study the scientific and technological implications of computers in education has been supported by an American Federation of Information Processing Societies (AFIPS) panel.

The panel, composed of members of the computer and educational communities, supports such study largely because none have been made recently and because funding for many educational projects involving computers has fallen off in recent years.

All levels of education, from pre-school to professional, would be examined by the commission to see "how computers could be used to improve our educational delivery system, to train people to live in our computerized society and how we should train our teachers to provide all of this," according to Alexander A.J. Hoffman, AFIPS panel chairman and professor and director of computer science at Texas Christian University.

The panel supports the concept of a study outlined by House bill H.R. 4326, which was submitted in June by Rep. James Scheuer (D-N.Y.). It was referred jointly to the Committee on Education and Labor and the Committee on Science and Technology and was heard by the former committee on Oct. 9, according to Dr. Grace Ostensio, a committee staff member.

Hoffman explained how the study, if it takes place, might help the educational community. "There has been a lot of talk through the years about computer-assisted instruction and computer management instruction, and there was a lot of funding in that area for a while.

"Also, there was a lot of funding for equipment, but that money has pretty much dried up," he explained. "U.S. schools and professional developers are anxiously waiting to see if we can provide a push in that direction."

The proposed two-year commission might awaken interest in, and give some direction to, the use of computers in education, Hoffman said. "We just don't have the teachers, the curriculum and the equipment we need. I think the commission will draw attention to this and possibly a funding bill will follow."

If H.R. 4326 is passed, its effect could be "rather dramatic," assuming that funding for projects is also voted. Universities, schools and professional developers could begin to implement or increase their use of computers, Hoffman asserted.

The Afips panel also released a report that named "relevant issues" pertaining to computers and education. Topics included computer-based learning and its future; computer literacy and societal impact; the importance of forecasts of expected changes; and training teachers of computer science.

Those issues and others were considered by drafters of the House bill, the panel said, but it added that personalized computing and attracting students for graduate study also deserve scrutiny.

The latter is particularly worth studying, Hoffman indicated, because so few computer science students are go-

ing on to earn master's and doctoral degrees, leaving universities and colleges without the manpower needed to teach computer science.

Industry and government has wooed potential candidates for higher education with "irresistible" salaries, shrinking the number of persons who bother continuing with their education. "I understand only 200 [doctoral candidates] graduated last year nationwide, as opposed to 300 the year before. It's crisis," Hoffman said.

"One hundred eight went to nonacademic positions; 70 went home to foreign countries. That left 22 available for 600 tentured university positions," he pointed out.

But putting together a commission is not the only way these areas could be covered, according to committee staff member Ostensio, nor are computers and their use the only subjects the study could include.

Assigning the project to the Office of Technological Assessment or another group already in existence would consume a lot less time than assembling a congressional commission, she said, echoing comments she has received as a committee member. She also suggested that in addition to computers, the study could be broadened to include the use of such technologies as telecommunications and video disk systems.

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Two Generations Ahead...



By Analyzing a Single Hair Scanning System Proves You Are What You Eat

By Jeffrey Beeler

CW West Coast Bureau
BERKELEY, Calif. — "You are what you eat," a popular saying goes, and now the wisdom of that observation is being demonstrated by a computer-based scanning system developed here.

By analyzing just a single strand of hair, the system can tell whether — and by how much — a person's bloodstream has been contaminated by toxic elements in his diet. In the same way, the system can also detect deficiencies of necessary dietary elements like iron, calcium and zinc, according to Albert Thompson, a physicist at the University of California's Lawrence Berkeley Laboratory.

Called the Scanning Automated X-ray Analysis Spectrometer (Saxas) by its developers, the system can spot 16 natural elements — including mercury, arsenic and lead — in human hair and can measure each in concentrations as small as 20 micrograms, Thompson said.

Living Record

Saxas uses hair for its analysis primarily because the substance provides a living record of a person's diet, much as tree rings can tell botanists something about the weather a tree experienced many years earlier in its life.

Most of the elements in the food a person eats are stored in successive

layers in his hair. By analyzing those layers, scientists can determine how much of each substance the individual has eaten and when it was consumed.

To determine the substance in a subject's hair, Saxas takes advantage of the well-known scientific fact that each of the 100 or so natural elements has its own characteristic spectrum, like a fingerprint or signature.

The system first bombards a hair sample with radiation from a high-voltage X-ray source, and a spectrometer reads the spectra of the resulting emissions. A 32K-byte Tektronix, Inc. 4051 mini-based CRT then analyzes the spectra, matches each to its corresponding element and thereby identi-

fies the hair sample's constituent substances.

The 4051 calculates each element's concentration, and shows the results on its display screen. If necessary, an on-line plotter then can convert the processor's calculations into a hard-copy graph.

With a typical hair sample, Saxas can compute test results in about half an hour. If the same spectral data were processed in batch mode, the element concentrations would take "several days" to compute, Thompson said.

In addition to the 4051 and a plotter, the scanning system incorporates a tape unit for storing the Tektronix unit's basic programs. The system also incorporates a 16K-word Texas Instruments, Inc. 9900 microprocessor that collects raw data from the spectrometer and controls all other hardware modules, including a stepper motor that moves hair samples into Saxas' X-ray chamber.

Heavy-Element Poisoning

Although most of its development took place here, the system currently operates at the University of Rochester in New York State, where it is being used to analyze hair samples from Iraq. The samples came from Iraqis who developed serious mercury poisoning after they ate a batch of contaminated seed grain.

For Thompson, the Iraqi incident represents a classic example of mercury poisoning because of the high concentrations of the toxic element. Thompson also sees the Iraqi case as a prime opportunity to learn how to use the Saxas system so it can someday be applied to more subtle outbreaks of mercury or other heavy-element poisoning.

Another potential use for the system might be as a tool for spotting individuals whose diets need to be supplemented with important elements like zinc. Zinc deficiencies have been linked with mental retardation.

Thompson even sees possible applications for the system in criminal investigations. Within a few years, for example, systems like Saxas might become as popular a means of identifying criminal suspects as fingerprinting is today.

Hair analysis may never be as reliable as fingerprint analysis, but it could provide "strong corroborative evidence" in police investigations, Thompson said.



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'Billy, As Soon As You Finish Your Homework Could You Help Mommy And Me Balance The Checkbook?

Software Taxation to Come Under Scrutiny in Mass. . .

By Marguerite Zientara
CW Staff

BOSTON — While a dozen states have granted software tax exemptions in recent years, since through judicial administrative or legislative actions, a major organizational shake-up within the Massachusetts Department of Revenue has stymied year-old efforts to reexamine and rewrite software tax regulations here.

Meanwhile, canned, off-the-shelf and custom software packages continue to be taxed in the Commonwealth, as they have been since 1966. While Massachusetts has no record of the amount of tax revenue that comes from software taxation alone, "there's a hell of a lot of money involved, and a lot of people are anxious about it," according to Frank Holland, chief of the department's appellate bureau and the resident expert on the subject.

After an informal hearing held last December at which industry experts attempted to convince the tax commission of the intangibility and therefore nontaxability of software and services [CW, Jan. 8], the tax commission just "collected material, put it aside and didn't work on it," according to one department spokesman.

Although the commission is aware of the significance of the issue, there have been "more [personnel] changes in the department in the last 12 months than [there have been] in the previous 15 years," making it difficult to act on the information collected during the hearing, the spokesman said.

Following a legislative reorganization of the department that became effective Aug. 1, 1978, five commissioners headed the department within a period of less than a year, a situation that "has

created chaos," according to the spokesman.

Also contributing to the disorder within the department was a change in policy from a categorical to a functional way of approaching the administration of taxes. In addition, "we were short of help," the spokesman noted.

Finally, in February 1979, L. Joyce Hampers was appointed tax commissioner. She "has a firm grip on the tiller and has continued the reorganization of the department," according to John White, Chief of the Rules and Regulations Bureau, the body that will write the software tax regulations.

While the newly created Rules and Regulations Bureau received a "substantial" appropriation for additional personnel positions beginning July 1979, it was only two weeks ago that the money actually became available for use, White said.

The bureau hopes to have a preliminary — not official — proposed regulation by the end of this year. Because the subject is so complex, "we'd want to go over [the preliminary proposal] with industry representatives and get some additional input into it," White said.

The preliminary draft of the regulation and an informal hearing would be followed by an official proposal and then a formal public hearing. "We don't want to be in the position of coming out with a proposed regulation and then discover there are so many things 'wrong' with it that the final regulation won't bear any resemblance to it, because then we'd have to have [a second] formal hearing at that point," White explained.

... While Texas Court Exempts Software From Tax

AUSTIN, Texas — A Civil Court of Appeals here has overturned a lower court ruling and concluded that computer software — either canned or customized — is intangible and therefore not subject to sales and use tax.

The ruling expands and clarifies a 1977 State Supreme Court ruling that defined keypunching as a service and therefore exempt from state sales tax [CW, April 25, 1977].

In the First National Bank of Fort Worth vs. Bob Bullock, Comptroller of Public Accounts, the bank paid four

software companies more than \$109,000 for four programs to process deposit and lending functions and general accounting.

While a lower court denied the bank's petition to recover the taxes paid on the grounds that the programs involved were canned and therefore could not be considered a service, the appellate court made no distinction between canned and customized software.

"The test . . . is not whether the product is 'customized' or 'canned,' but whether the object of the sale is tangible personal property," Chief Justice John C. Phillips wrote in his decision.

The 1977 Supreme Court ruling in the case of Statistical Tabulating Corp. vs. Bob Bullock concerned only keypunching and no other computer software or services.

Since the Supreme Court decision, Texas DPs had been working toward an interpretation that would include software and services other than keypunching in the definition of "intangible, personal property," but to no avail.

The First National Bank decision was filed in July, and the state was denied a rehearing on Aug. 1, 1979.

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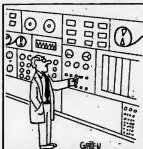
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Nine More Airports Slated to Receive Arts II

By Marguerite Zientara

CW Staff

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) has purchased \$5.25 million worth of computerized air traffic control equipment from Burroughs Corp. for installation at nine U.S. airports with rising traffic levels.

The contract brings to 80 the number of U.S. airports scheduled to be equipped with Automated Radar Terminal Systems (Arts II) by the end of 1980. Presently, 44 of the systems

have been installed and 27 are slated to go in by the close of next year, an FAA spokesman said.

Developed by Burroughs Corp., the Arts II was designed for use at airports with low- to medium-density traffic levels. A similar but more sophisticated system, Arts III, is currently in use at more than 60 airports with heavy traffic.

Replaces Manual Method

The Arts II units will replace a method of tracking airplanes in the

terminal area based on radio contact with pilots and handwritten notes about an aircraft's flight number, ground speed and altitude.

Now, when a signal from an aircraft's transponder is picked up by the airport surveillance radar, it is fed into the Arts II computer and translated into an alphanumeric data tag that appears on the controller's radarscope next to the radar blip.

Airports scheduled to receive the latest order of Arts II are in Santa Barbara, Bakersfield and Stockton, Calif.;

Hilo, Hawaii; Clarksburg, W. Va.; Terre Haute, Ind.; Manchester, N.H.; Ft. Myers, Fla.; and Eugene, Ore.

Other Deliveries

Additional units purchased under the contract will go to Naval Air Station at Patuxent River, Md., and the FAA's National Aviation Facilities Experimental Center in Atlantic City, N.J.

Two others will be used as interim replacements for Arts II's temporarily out of service.



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Modifies Stand on Subsidiaries Industry Group Acts to Revive Rewrite Bill

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — Another attempt was made earlier this month to revive the comatose Communications Act rewrite effort in Congress. This time, the attempt was made by the Telephone Industry Policy Council, a group representing AT&T, independent telephone companies and related labor unions.

The council issued a statement of "Telecommunications Policy Principles" which appeared, at least to some observers, to modify many of the previously stated industry positions. This modification may be more rhetorical than real, however.

Specifically, the telephone industry group conceded that separate subsidiaries might be acceptable to the carriers on somewhat different terms than those announced previously. The statement of principles says that although "adequate records" are one way to prevent regulated carriers from cross-subsidizing unregulated services they might be authorized to offer under the pending legislation,

"regulators should be authorized to impose more stringent conditions, including a requirement for organizational separation."

But the pending legislation "should set forth the maximum degree of organizational separation that could be required in such cases."

Hot Topic

Separate subsidiaries are a hot topic these days. The specialized carriers want AT&T's intercity and local exchange services to be offered through fully separated organizations, and most members of the computer industry seek a similar separation between the telephone company's emerging computer-based systems and services — like the Datapack 40/4 and Advanced Communications Service — and its monopoly telephone network offerings.

The telephone industry group, by specifying separate subsidiaries only for unregulated services — such as data processing — is clearly not satisfying either of these options.

What could turn out to be

more significant, though, is that the National Telecommunications and Information Administration (NTIA), the President's chief telecommunications advisor, recently said the carriers should establish separate subsidiaries for unregulated services [CW, Oct. 1]. NTIA also believes AT&T should continue offering local and long distance telephone network services on the present integrated basis pending the outcome of a proposed Federal Communications Commission study. The phone company, in its Computer Inquiry II comments, called for a similar study.

Statement's Significance

According to "Telecommunications Reports," a widely read newsletter, the major significance of the council statement is that it gives federal and state regulators "discretion to reach decisions in crucial areas where earlier recommendations of [the telephone industry] would have limited the options by more rigid legislative standards or required that the basic framework of decisions be made in Congress." However, this "discretion" is hedged in with multiple qualifications.

For example, the statement says "regulators" should define "basic telecommunications services," but quickly adds that "national telecom-

munications policy must recognize and provide for the existence of a technically and economically integrated nationwide network."

Bell's opponents strongly oppose both of these conditions. They also want the federal government to control basic intercity communications service because they be-

lieve most state regulators are biased in Bell's favor.

By comparison, the Telephone Industry Policy Council said, "Joint federal-state regulatory determination as to cost allocation and accounting procedures, and for resolution of other issues, [will be required] during the transition period and beyond."

Group Cites 'Inconsistency' In Ecom, Presidential Policy

CW Washington Bureau
WASHINGTON, D.C. — The proposal for a nationwide electronic mail service by the U.S. Postal Service is "substantially inconsistent" with a recent Presidential policy directive, according to the Computer and Business Equipment Manufacturers' Association (Cbema).

In a comment filed with the U.S. Postal Rate Commission, which must approve the Electronic Computer-Originated Mail (Ecom) service before the post office can offer it, Cbema pointed out that last July the White House endorsed the limited use of electronic transmission to distribute the mail, but directed the Postal Service to separate Ecom from its other operations for accounting and rate-making purposes.

The Postal Service was also told it could not finance Ecom with tax money or revenues from other mail services.

Neither of these conditions allegedly has been satisfied by the proposal now pending before the Postal Rate Commission.

Cbema also criticized the process followed by the Postal Service in selecting a contractor, particularly the total absence of provision for participation by suppliers other than Western Union. The association observed that the Administration directive emphasized

avoidance of any restriction limiting entry into the electronic mail field. And, while the Administration said the Federal Communications Commission (FCC) should regulate the pricing of the electronic portion of Ecom, the Postal Service continues to argue that the FCC has no jurisdiction.

Bit Against ACS

Concurrently with its statement to the Postal Rate Commission on Ecom, Cbema advised the FCC to reject AT&T's proposal for the Advanced Communications Service (ACS).

AT&T's new venture is "the sheerest attempt to ignore FCC rules and definitions and to mask the true nature of the service by use of communications terminology," the association contended. The result of this process "would include an unprecedented extension of regulation into the presently competitive marketplace for data processing services."

Cbema added that documentation filed by AT&T shows ACS is predominantly a data processing service. According to this documentation, the association said, ACS involves extensive storage and manipulation of data unrelated to the transmission of addressed messages between terminals and/or hosts.

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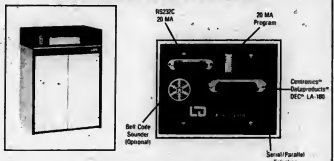
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OECD Meets in Paris to Head Off Piecemeal Data Flow Legislation

By Jake Kiechler

CIV Washington Bureau
PARIS — The Organization for Economic Cooperation and Development (OECD) is moving to head off any piecemeal data protection measures in Europe that might arise while transborder data flow agreements are hammered out.

The OECD Information Policy Group met here last week to consider recently drafted, voluntary privacy guidelines for personal data; it was also scheduled to address the protection of nonpersonal data. In a document issued last month, the OECD Secretariat noted that while the organization had completed its personal privacy protection guidelines, it has had "more difficulty" in investigating "the economic and legal problems of nonpersonal data."

"It has become apparent," the OECD paper said, "that

some member countries look at the issue [of nonpersonal data flow] very much from an economic point of view." Possible conflicts of data protection activities could be exacerbated because "a substantial time lag may... be required for their negotiation."

"The problem arises, therefore, of an interim period," the OECD Secretariat said. "Member countries should ensure that during the period needed to better understand issues and reach agreements on national positions in the nonpersonal field, no excessively negative action is taken by any member country."

The document noted that "action of this sort might well preempt the reaching of agreement on a new international framework for data communications and computer services."

The OECD was therefore slated to consider drafting an "OECD Transborder Data Flow Pledge," a "broad-ranging statement of principle by member countries [that] could act as a framework for subsequent negotiations on these issues." The pledge "would aim at covering an area where a widely accepted international regime does not yet exist," according to the proposal.

It would, as urged recently by Warren Christopher, U.S. Deputy Secretary of State, "anticipate protectionist challenges before they become urgent."

Covering a "limited period of time" — perhaps two years — the pledge would "affirm the determination of member countries":

- "To avoid adopting national policies of restricting the imports of data processing services or taking any actions which might restrict the flow of information between themselves."

- "To refrain from discriminating against imported data processing or telecommunications services."

- "To avoid taking any measure of supplementary taxation on imported information and data processing services."

- "To cooperate in setting up a new international legal framework covering the various aspects of importance to the rapidly growing field of transborder data flows, both of a personal and nonpersonal nature."

- "To consult with each other in order to assure that such a statement of principle is properly implemented in accordance with international obligations and taking into account the special needs of developing countries."

While the pledge is in line with U.S. philosophy on non-

restriction of transborder data flow, its adoption was by no means assured. The pledge "has not received any extensive discussion" by U.S. representatives to the OECD discussions, William Fishman of the National Telecommunications and Information Administration, remarked recently.

But background information supplied with the OECD proposal indicates the organization is generally sympathetic to the pledge's content.

"The creation and development of new data networks is not, in fact, opposed by any OECD member country," the document said. "It is realized that they provide new information infrastructures for a variety of new information activities, which may become, one of the growth sectors for OECD economies in the future."

But, for this reason, protectionist arguments calling for strict control of the flows are sometimes advanced; were these applied, they might seriously reduce or hinder the flows of data between member countries.

The "most recent example" of such protectionist measures, according to the document, is a resolution passed in May by the European Parliament. That resolution proposed that the European Economic Community "create a European Data Protection Commission, with powers to license all transborder flows of personal data coming in or going out of all nine European community countries."

"At the beginning of the decade of the 1980s, it would be an unfortunate development if OECD member countries — or, for that matter, countries outside the OECD region — were to apply excessive measures to create a field which is international in nature," the OECD said.

Precedent for Action

Although adoption of the pledge is in doubt, the OECD did note a precedent for such action. An OECD Trade Pledge was adopted during the "interregnum" of the "Tokyo round" of international trade negotiations. These interim agreements cover areas of international activity under active negotiation.

The value of such pledges, the OECD explained, is that they are "sufficiently open-ended to be accepted by member countries while being sufficiently precise in [their] commitment to have actual policy significance."

Fishman noted that assessing the long-range value of OECD agreements in this area is difficult; the negotiations result in voluntary guidelines.

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Auction System Founders on Maiden Voyage

By Tom Henkel

CW Staff

WASHINGTON, D.C. — The maiden voyage of a computerized auction system ran upon stormy seas here because of bungled plans and an overall lack of organization.

Dealers who participated in the combination auction and antique show called it a "flop" and said they lost money on the event, which was held recently at the Capital Centre here. They claimed too many items were scheduled to be auctioned during the nine-hour event — supposed to be carried in several cities in the U.S. via cable television.

In addition, the dealers claimed their wares were poorly handled and were not adequately described. In some cases, Artnet International, Ltd., which handled the auction and sale, only showed black-and-white photographs of items to be auctioned rather than the real thing, which was on display about 100 feet from the gallery's makeshift TV studio on the auditorium floor.

The system's inventor and promoter, Michael Behar, president of Artnet, said a lot of things went wrong — but his system was not one of them.

Based on an MOS Technology, Inc. microprocessor, the system was supposed to determine the maximum price bidders were willing to pay for a given item. Based on that information, the system software would present the items in the most popular — and profitable — order (CW, July 23). Despite the show's problems, Behar said the auction worked better than expected.

Behar blamed the cable television company that produced the auction — which was run similar to Public Broadcasting Services fund-raising auctions — for a delay of two and a half hours in starting the auction. Behar said the auction was supposed to run a total of

nine hours over three days. The cable company chose to rebroadcast parts of the Friday portion of the auction since many of that day's items were not sold, Behar said.

"From an operational standpoint, we had enough time. As it was, we covered every dealer" participating in the auction, he added.

Addressing the charge that items to be auctioned were not presented properly, Behar contended that many of the dealers were at fault. Artnet set up a schedule for each dealer to bring pieces by the studio for a taping session, but some dealers did not follow the schedule, Behar said. The result was a backlog in taping items.

When a video tape of the item was not available for broadcast, Artnet

used the black-and-white photographs of the items in the show catalog. "We're not saying we were totally innocent there. In some cases [dealers] did show up at the appointed time and they couldn't get [their items] videoed because there was a 10- to 15-minute backlog," he added.

A 2,000-head turnout — when Behar had promised 20,000 — upset many dealers before the auction got under way. Poor advertising, a spell of very bad weather followed by very good weather, a surprise parking charge at the auditorium and the remote location of the Capital Centre were cited by Behar as reasons for the poor turnout.

Nevertheless, Behar said he still has confidence in his system. "In terms of concept, there are many people who

still have faith in the concept. Those that were at the event and those who were watching [were pleased]. We had cable TV stations calling us at the last minute, preempting regular programming just to carry this," Behar said.

Admitting the Capital Centre show was his first combination auction and antique show, Behar said he hopes the reaction to his system will be better at his next two scheduled shows.

"All things considered, it was the finest show Washington ever had — it was unfortunate not enough people turned up to see it. Many first-time shows are not successful, especially when the arena has not been used for similar events. We didn't say this was our 42nd year and [the dealers] knew it was a risky venture," Behar said.

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NCC Scouting for Seminar Ideas, Leaders

TAMPA, Fla. — Officials for the 1980 National Computer Conference scheduled for May 19-22 in Anaheim, Calif., are looking for presenters for the Professional Development Seminar (PDS) segment of the conference.

James Weiss, NCC technical training manager, said out-

lines from those wishing to conduct the day-long seminars should be submitted to him by Nov. 1.

NCC expects to present about 15 PDS classes at the Anaheim show. Hot items on the list of desired subjects include decentralized processing, minicomputers and struc-

tured programming. Weiss said he is also interested in most other subjects.

Number Up in the Air

"We're soliciting proposals from people who might want to teach these one-day classes. After we've seen the proposals, we'll decide which ones we're going to offer."

"Without knowing what I'm going to get in the way of proposals, [the number of PDS seminars offered at NCC '80] is still up in the air. It depends on two things: the number of rooms we can get and the number of proposals we get," Weiss said.

Just about anyone can qualify to present the seminars. Weiss said he is looking for "anyone with a marketable subject who is a good presenter. Most people making these presentations have established themselves in the consulting business, in publishing or as academicians."

Weiss hopes to "actually sit in on some of the actual presentations" before he decides which sessions to offer.

Some Contacts Made

He said he had already made contacts with some potential presenters about possible presentations.

"If I didn't know you from your reputation, I would probably ask something about your topic and the level of detail you could cover in about six hours. I would ask what you thought the presentation was for and what the prospective audience was."

"Beyond that, I would like to leave it wide open; I don't want to restrict ideas," Weiss said.

Prospective presenters are asked to outline the subject to be covered on a standard form, available from Weiss through CTE Data Services, P.O. Box 1548, Tampa, Fla. 33601.

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ROSS/V (RSTS/E Operating System Simulator for VAX) is a software package, written in VAX-11 MACRO, which provides a RSTS/E monitor environment for programs running in PDP-11 compatibility mode on DEC's VAX-11. It runs under VMS and interfaces to programs and run-time systems of the RSTS/E monitor call level. ROSS/V makes it possible for DEC PDP-11 RSTS/E users to move many of their applications directly to the VAX with little or no modification and to continue program development on the VAX in the uniquely hospitable RSTS/E environment. Most BASIC-PLUS programs will run under an unmodified BASIC-PLUS run-time system.

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(800)543-4613 outside Ohio

(Western U.S.)
Online Data Processing, Inc. 637 Hamilton
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Becomes No. 4

California Enacts DP Crime Bill

By Jeffrey Becker

CW West Coast Bureau
SACRAMENTO, Calif. — California bolstered its efforts to combat DP fraud and vandalism recently when the state enacted its own version of the federal computer crime bill now before the U.S. Senate. S.B. 66, which is scheduled to take effect next Jan. 1, was signed into law here on Sept. 28 by Gov. Edmund G. Brown Jr.

California thus becomes the fourth state to have enacted its own computer crime legislation. The other three states include Arizona and Florida, both of which passed S.B.

66-like bills last year, and Colorado, which followed suit late last May.

Law's Provisions

Introduced in December 1978 by state Sen. Lou Cusumano (D-Woodland Hills), the California computer crime law forbids the use of computer hardware for extortion or fraud. The legislation also outlaws the malicious access of DP equipment and the malicious destruction of programs or computer-stored data.

Individuals who violate the law will be guilty of a felony and will face a \$2,500 to \$5,000 fine or 16-month to three-year prison sentence, or both.

The law's provisions apply

to all computing machinery except pocket calculators that "are not programmable and capable of being used in conjunction with external files."

Cusumano and his associates modeled their legislation after S. 240, the federal computer crime bill introduced by U.S. Sen. Abraham Ribicoff (D-Conn.) and others.

Though criticized in some quarters for being vaguely worded and ill-defined, the legislation has received generally favorable reviews in California. The state has provided the setting for some of the country's most costly and widely publicized DP crimes, including two multimillion-dollar wire fraud schemes perpetrated by computer analyst Stanley Mark Rifkin.

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AMA Plans Courses

NEW YORK — Two courses in evaluating and acquiring applications software and structured programming techniques are being offered for late October and early November by the American Management Associations (AMA).

Sponsored by the AMA's Center for Management Development, the courses will be held Oct. 31-Nov. 2 and Nov. 5-9, respectively, at AMA headquarters.

"Techniques for Evaluating and Acquiring Application Software" provides a step-by-step approach to finding the right system for individual company needs. "Structured Programming" combines an in-depth exposure to structure theory with a series of exercises and case studies, the AMA indicated.

Further information is available from the AMA at 135 West 50 St., New York, N.Y. 10020.

DDP Conference Set

WALTHAM, Mass. — A four-day executive conference on "Distributed Processing: The Applications Payoff" will be sponsored by International Data Corp. (IDC) Oct. 28-31 at the Dorset Country Club in Miami, Fla.

Each day of the conference will focus on a different aspect of building and living with a distributed data processing (DDP) system. Scheduled subjects include malfunctions

in DDP systems, linking terminals, data bases and systems and a look into what the future holds for DDP.

The four-day conference costs \$750. Additional members from the same organization can attend for \$495. The executive conference is offered free to subscribers to IDC's Continuous Information Service, IDC, 214 Third Ave., Waltham, Mass. 02254.

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Conversion Causes Welfare Payment Delays

By Ann Dooley
CIV Staff

AUSTIN, Texas — Thousands of state welfare recipients are waiting for their overdue monthly welfare checks to arrive. Claiming this has been an on-going problem since last March, the recipients are blaming the delay on a recent computer conversion at the Department of Human Resources (DHR) here.

Welfare checks and food stamps have been delayed up to a week or more, and at least one family was reportedly evicted from its home because it could not pay the rent. Other welfare families have been forced to use all their money to buy food instead of allocating it to other needs, a welfare rights group charged.

But officials within the DHR minimize the problem,

saying that although the conversion process was complicated, it was a "huge success." They further argued that any delays experienced in the last few months were no longer than usual.

Most affected by the payments controversy are those receiving Aid to Families with Dependent Children (AFDC) benefits and those on the food stamp program.

Although DHR officials have claimed for months that the problems were being cleared up, the Association of Community Organizations for Reform Now (Acorn) contends the situation is just as bad as ever. Acorn further stated that emergency allocations provided by the state are only "a drop in the bucket."

"A lot of people's lives are being affected, and [the DHR]

can't take months and months to change things," according to Willo Harden, an AFDC mother of three.

Root of Problem

The problem began two years ago when the State Board of Control, the state purchasing agent, selected a computer system in an open competition. Until that time, the DHR had been using an IBM 370/156 but had outgrown the capacity of the system. The department was strongly encouraged to switch to a competitive procurement process and did so.

The five mainframes that provided bids included IBM, a third party IBM-compatible company, Amdahl Corp., Burroughs Corp. and Univac.

The purchasing agent threw out the IBM and Amdahl bids because the two had not strictly adhered to a portion of the Request for Quotations (RFQ) process, according to David England, Deputy Commissioner of Information Systems. The Board ultimately decided that Univac met all the specifications and awarded it the contract.

"We didn't get the computer we wanted, but we did a successful job with the one we got," England recalled.

The Univac 1100/40 is equipped with 64 disk drives, six high-speed printers and a large number of tape drives and runs an on-line eligibility system. The 1100/40 now holds more than two million names in its data base.

The department will add an 1100/80 in the next few months to meet its need for greater capacity, England said.

The conversion to the system began in the fall of 1977 and was carried on through the summer of 1978. At that point, the system was operating relatively well and the sophisticated eligibility system was installed in March.

The eligibility system is probably the most complex in the country, England noted, but it had no more than the usual start-up problems. Data entry delays and errors were the major source of delays; otherwise, both the computer and the software were working well.

Backlog Builds Up

But problems began to occur shortly after the eligibility system was installed, when new regulations were added to the food stamp program, requiring new information and adding a larger case load to DHR files.

Each case had to be individually reviewed and new information added to it, England said. The two simultaneous changes resulted in backlogs, especially in the metropolitan areas of the state.

Although England appeared to play down the delays, it was learned that in one regional area, the backlog was as high as 15,000 to 16,000 forms.

Additional problems included overloaded phone lines and more downtime than was anticipated, England said. There may have been some delays at the time, but there is never 100% certainty in getting checks out on time," he

said, adding the computer is just one part of the whole system of delivering the welfare checks.

Erwin Dabbs, regional administrator of the DHR, agreed the situation is definitely getting better. "Two or three months ago, there was a heavy backlog, but now we are in within a day or two of processing all forms as they come in," he said; adding "that's not to say something might happen to cause a backlog again."

According to Dabbs, part of the problem was a delay in response time of up to 30 seconds — a delay that is now down to six seconds. In addition, the DHR overestimated the workload the system could handle. It was not meant to operate 24 hours a day, seven days a week. However, he said, the new 1100/80 should even things out.

Like England, Dabbs blamed the delays on the fact that too much was happening at once. The program changes and the system installation certainly didn't "create business as usual."

Some critics of the system contend the total conversion will cost as much as \$35 million, a figure England denied was accurate. The system was designed to speed up the case process and thereby save money, not the other way around, he pointed out.

As a result of the delays in payment, a welfare group has called for the scrapping of the computer and hiring of more employees to process the data manually. In addition, a lawsuit has been filed against the DHR.

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Nov. 27-29, Washington, D.C. — Inteltec '79: International Telecommunications Energy Conference, sponsored by the Institute of Electrical and Electronics Engineers. Contact: R.H. Jones, P.O. Box 686, Galion, Ohio 44633.

Nov. 27-29, Orlando, Fla. — Cause National Conference: Planning Higher Education Information Systems for the 1980s. Contact: Cause, 737 29 St., Boulder, Colo. 80303.

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**PCC's
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Fifteen Guidelines Published AMA Sets Privacy Policy for Medical Data

By Marguerite Ziemara
CW Staff

CHICAGO — While the recorded instances of theft or misuse of computerized medical patient information are few compared with such occurrences in manual systems, misuse of computerized information usually involves "exceptionally large segments of information," according to research by the American Medical Association (AMA).

Furthermore, such instances of misuse generally involve persons authorized to access the data files. With these findings in mind, the AMA has established a set of 15 guidelines for maintaining confidentiality in computerized medical data bases. Concerned primarily with the privacy, confidentiality and security of clinics or individual physicians' computerized data bases, the guidelines are "appropriate to any medical data base," according to Daniel Harris, codirector of the AMA's "Computers and Medicine" publication, in which the guidelines recently appeared.

Adopted as AMA policy in 1977, the guidelines have been circulated to more than 1,000 public and private sector organizations besides the 184,000 members of AMA, Harris noted, suggesting a "significant contemporary interest" in the subject.

Although the guidelines exist solely as recommendations without any force and without penalties for noncompliance, according to Harris, they were written to heighten physicians' and others' awareness of the privacy problem in the face of "increased pressure to obtain medical data for clinical, administrative and archive purposes."

Guidelines for Management

Since medical information is often used as a basis for major clinical or administrative decisions affecting a patient, the AMA observed, procedures should be developed to ensure that the source of confidential medical information entered into a computerized system is verified.

In addition, patients and physicians both should be advised of the destination and uses of any patient information before a physician has released it to a third party. Third-party organizations to which data might be given include professional standards review organizations, medical peer review bodies, health systems agencies and third-party insurance intermediaries. When a computer facility storing a confidential medical data plans to distribute internally any reports that include patient, identifiable data, both doctor and patient should be informed prior to the distribution.

To combat an "unwarranted assumption" that computerized data is correct, the guidelines call for mechanisms for adding to or changing data in a computerized file. "The procedures should indicate individuals authorized to make changes, time periods in which changes take place and those individuals who will be informed about changes in the data," the AMA suggested.

The guidelines also urged systematic purging of computerized records to eliminate archaic or inaccurate data — and notification of doctor and patient

before and after the purging.

Furthermore, a computerized medical data base should be on-line only when authorized programs requiring the medical data are being used, to avoid unauthorized easy access to confidential records, the AMA advised.

As for physical security of medical DP systems, the AMA proposed that "stringent security procedures" for entry into the computer area should be developed and "strictly enforced."

Employees involved in maintaining and using medical data bases must be educated about such rules and the penalties for breaking them.

The misuse of computerized data by authorized personnel can be either

conscious or inadvertent, according to the AMA. To aid the implementation and monitoring of confidentiality policies, medical records facilities should designate a "security officer" in an effort to "minimize errors of omission or commission with respect to observance of confidentiality procedures."

In addition, all persons and organizations with access to a medical data bank should be specially identified, along with their permitted levels of access.

In cases where a third-party agency or individual does have access to some form of patient-identifiable medical data, patients should be advised in advance of the fact. In addition, patients

and doctors should have the opportunity to approve or disapprove the release of patient-identifiable data to parties outside the medical environment.

In addition, procedures should be developed to limit the dispersion of confidential medical data only to those individuals or agencies with a bona fide use for the data, the AMA recommended.

Finally, all third-party organizations or individuals who receive confidential medical data should be advised that they have no right to release the data to any other individuals or organizations, the AMA urged.

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Student Alahyar Mikha talks to Proctor Virginia Murphy during Tulane University's Summer Computer Institute course.

Summer Course at Tulane Caters to All Levels of Ability

By a CW Staff Writer
NEW ORLEANS — It's a far cry from the old-fashioned one-room schoolhouse, but the Computer and Information Systems Department here at Tulane University is using the same concept for its summer computer course offerings.

Called the Summer Computing Institute, the Tulane

course offers just about everything to everyone. Open to all, from high school juniors on up to computer science graduate students, the course uses the experience of more advanced students as a basis for teaching the novice. Graduate students enter the course for credits in project-oriented assignments, while the less experienced join the

group as a primer to future computer science studies, according to Dr. Victor Law, chairman of the department.

The course evolved as part of a realization that the university often had problems filling summer programming courses. Because it could not afford to pay full-time professors to teach half-full classes, the unit decided to lump its programming courses into one basket, led by two full-time faculty members and six graduate student assistants who are paid a stipend to proctor the course.

Languages offered include Fortran, Basic, Cobol, PL/I, APL, Algol, Pascal and assembly language Micro-11 — all carried on the school's Digital Equipment Corp. PDP-11/45 and Decsystem 20 mainframes.

"Not everyone who participates does it all. Almost everyone chooses a selection of things — usually two. Each person is also involved in one of the team programming projects," Law said.

"The graduate students are the group leaders for the projects, and we pay them to assist in running the show. They're not really grad assistants in the strict sense of the word, but they are very active in passing their experience along to the less experienced people."

"We always hope to get a good cross section of students, because we depend heavily on the experienced people's feedback," he added.

In addition to gaining programming experience, students also attend a series of vendor sessions presented by DEC, IBM and others. These sessions bring students up to date on hardware and operating system changes.

This past summer was the first year for the course.

"It was suggested by a member of our board of advisors who is a vice-president with an industrial concern. We carried through with it, and it was a success," Law stated.

The eight-week course meets four hours a day and costs \$650. The course is now limited to 40, but it might be expanded to two sections if there is greater interest next year, Law said.

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See Page 56

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EDITORIAL

Lessons of History

The Second U.S. Circuit Court of Appeals has asked both IBM and the Justice Department to start negotiating a consent decree to settle the 10-year-old antitrust suit brought by the government against the firm [CW, Sept. 24].

And while it appears those negotiations are not moving much faster than the case itself, the government and people in the computer community should look at any consent decree with a jaundiced eye.

After all, IBM has signed consent agreements with the government before (most recently in 1956), but those agreements have done little to curb IBM's power in the marketplace — and even may have skirted by the industry giant. Two recent news stories illustrate this.

The first concerns ITEL Corp., which — like RCA Corp., General Electric Co., Xerox Corp. and Memorex Corp. before it — was forced out of the mainframe marketplace largely because of IBM's entrenched position. By floating rumors about the E series (introduced as 4300) and the anticipated H series of machines, IBM was able to keep users from committing to software-compatible machines like those offered by ITEL.

At the same time, by generating confusion in the marketplace, IBM caused many users to lease rather than purchase computers so they wouldn't be caught with outdated systems when the new units were released.

These actions had some impact on IBM itself, but the firm knew their greatest impact would be on firms like ITEL, firms which do not have as much capital as IBM and which cannot raise \$1 billion with a snap of its fingers, as IBM has been able to do.

From its position of power and because of its policy of slowly leaking details of coming computer systems in order to confuse the market, IBM clearly has been seeking to stifle competition from the software-compatible plug-compatible peripherals makers into bankruptcy when their incursions into the IBM base became too severe.

At the same time, there is a report that Justice Department officials privately admitted that IBM may be violating the Consent Decree of 1956 by its trade-in policy on certain mainframes [CW, Oct. 8]. Swamped by its decade-long suit with IBM, however, the Justice Department does not plan to take any action to enforce that decree. In other words, IBM can violate the decree's provisions with apparent impunity.

Therefore, a new consent decree would probably be as ineffective as any in the past, and there is little reason for the Justice Department to get bogged down in negotiating one with IBM.

While the U.S. vs. IBM antitrust case is pretty much a joke because of its poor handling by the judge, because of IBM's legal tactics and because of the Justice Department lawyers' inability to cut through the IBM wall of obfuscation, it is the best hope for some sort of resolution of the issues it raises.

The two sides should not waste time negotiating their way out of the case, but rather make a new and concerted effort to finish presenting the case and get it in front of the judge for resolution.

DATA PAST

Five Years Ago Oct. 16, 1974

WHITE PLAINS, N.Y. — Expanding on several previous nonstandard concepts such as the 96-column card and the 3348 data module, IBM introduced another idea in information storage — the data cartridge and "virtual mass storage."

The IBM 3850 mass storage system took virtual storage one step farther from the mainframe. With 3330 disk drives used as a "staging" area, information contained on tape cartridges could be mechanically retrieved and

loaded onto working disk packs under program control.

Eight Years Ago Oct. 13, 1971

WHITE PLAINS, N.Y. — In a move affecting most of its users, IBM extended magnetic tape capabilities to the System/3 Model 10 and added the 96-column card to most smaller models of the 360 and 370.

In addition, the 3270 CRT system would be added to the 310 through new software.



LETTERS

CP-6 'On the Mark'

I was dismayed to see the misleading headline "Honeywell Finally Delivers, But Applicability of CP-6 Limited" on the front page of the Sept. 17 issue. Perhaps this should not have been such a surprise, since *Computerworld* consistently appears to find something negative to emphasize when writing about Honeywell.

While I am no longer in Honeywell's employ, I think I can best set the record straight. From the project's inception, until Sept. 1, I was director of the CP-6 development for Honeywell. CP-6 has not only met its schedule target (established back in 1976), but from a functionality standpoint the system is richer than originally planned. In other words, it's right on the mark as a replacement for CP-V.

The vast majority of the 1,200 Xerox users the article referred to who are not served by CP-6 are users of 16-bit minis: Sigma 24, Sigma 3s and Xerox 530s. One would hardly expect CP-6, a multiuser, mainframe operating system, to properly address the needs of such users either in function or economics.

Of the remaining users not directly served by CP-6, a large number operate real-time control systems in dedicated applications. Most of these customers have unique requirements which we considered inappropriate as design points in a general-purpose operating system. I'm sure they would agree.

Shel Klee

Los Angeles, Calif.

Absurd Commendation

It is ironic, if not amusing, that Alan Taylor should display 38 lines of archaic Cobol code as an example of what we should strive for in the 1980s ["Standards Source Cobol to Be Expected in '80," CW, Sept. 24].

I am aware that the "structured revolution" has met with a good deal of

skepticism, reluctance and stubbornness. But to commend source code that lacks any semblance of structure, consistency or modern style seems absurd.

Taylor has done a disservice to Dijkstra, Yourdon, Armstrong, Weinberg, Wright, Kaufman, Goetz, Neill and others who have attempted to improve our Cobol programming techniques in the 1970s.

It is clear to me, and I'm sure to the gentlemen just mentioned, that "how it is done" really does matter and that "old-fashioned good management and discipline" aren't enough to ensure that programmers will produce accurate, efficient and maintained programs.

John A. Siegel

Santa Clara, Calif.

Failure in Day Algorithm

A letter in the Sept. 24 issue presented an "algorithm" for determining the day of the week given the date. Unfortunately, it fails starting March 1, 2000, which is a Tuesday by the Gregorian calendar, by giving Wednesday as the result.

All subsequent dates will be off also. (2000 is not a leap year by the Gregorian calendar.)

Robert Kowalski

Winona, Minn.

Not Just in Advertising

The editorial "Low Blow to Women" [CW, Sept. 24] pointed out an example of sexism in CP advertising.

I found it both timely and amusing that a Page 1 picture in the same issue showed Dr. Ruth Davis, who was named the Data Processing Management Association's Computer Science "Man" of the Year.

The cartoon points out that sexism in data processing is not limited to advertising.

Charles R. Lucas

Milton, W. Va.

READER COMMENTARY/Herbert Halbrecht

Inner City Youths Could Fill DP Staffing Needs

"Grow - Or Raid" [CW, Sept. 10] reported on my views concerning possible sources for tomorrow's DPs. However, the article only lightly touched on one of three alternatives I mentioned: the underemployed worker who has little formal training. I feel this subject deserves more attention.

In the mid 1960s, I was a member of the board of trustees of a not-for-profit organization in Washington, D.C., whose function was to train disadvantaged and unemployed minorities, primarily from inner cities, to be entry-level programmers and computer operators. We had a 93% success rate (defined as people who graduated, got and kept jobs in the professions for which they were trained).

Program Can Work Again

This program was under Department of Labor contracts, and although we

were quite successful for several years, subsequent changes in the Department of Labor management resulted in abandonment of many programs, including this, for reasons I never did understand. But it worked, and it can work again. There are in the inner cities of America hundreds of thousands of unemployed and underemployed younger people and younger adults who are highly educable and who, if given the opportunity, can be brought from the slag heaps of society into the mainstream.

Recently I had the privilege of hearing the Navy's Capt. Grace Hopper give the luncheon address at the Society for Management Information Systems (SMIS) National Conference in Minneapolis. Her address related to the leadership young people seek and need, not only in the computer profession but in their lives in general.

Hopper has been for years one of the great, creative and inspirational leaders of our field. As sophisticated as her education was, she not only inspired us, but brought tears to most of our eyes. (To those who would find this corny, I would only say that I pity those who are so insipid they cannot be inspired and so weak they cannot cry.)

Speech Inspired

It was Hopper's speech that inspired this idea: Why not put together the needs of our industry for a tremendous number of additional computer professionals at entry levels and the talent potential of the underemployed in our country's slums - catalyzed by the leadership spoken of by Hopper? The kinds of people involved - the minorities, the hard-core unemployed, with or without formal education - have the street sense so badly needed in our industry. They can make a valuable contribution to the tangled problems of industry.

Let's imagine that we have a program whereby American industry would provide the training facilities and trainers in this computer profession - government absolutely nothing with the exception of short-term funds to provide income for people while they are in training. I feel certain that the hardware manufacturers would be willing to donate access to their hardware.

Let us visualize those programs being administered at the very top by volun-

teers from professional societies such as SMIS and the Association for Computing Machinery, so that realistic and useful standards are involved.

Money for this should be easy to raise. I can easily imagine the Fortune 800, for example, being asked to contribute a minimum of \$50,000 apiece, this could provide \$4 million, with time donated by senior professionals, as well. I would personally be pleased to kick off the program with the first donation.

"A Great National Treasure"

Although I haven't broached the matter to Hopper, I am certain that the Navy, in its benign wisdom, will find additional reason to retire her once again. Since I consider her a great national treasure, so long as she's working, I hope she could be prevailed upon to head up the program, which would absolutely assure it would be a real program and not a boondoggle. I am certain there are flaws and problems associated with this, but let us focus on its positive potential. If there are others who share some of these dreams and who would be prepared to work towards making them reality, we should consider this a project of this type can't be carried out in profession, which has made so many major contributions to technology and industry, where can it?

Halbrecht is president of Halbrecht Associates, Inc. 695 Summit St., Stamford, Conn. 06901.

HUMAN CONNECTION/Jack Stone

Some of My Best Friends Are Public Speakers

I saw him do it with my own two squinty eyes. I saw this speaker, delivering a key and critical message before a vast audience, use the thumb and index finger on his right hand to clean the five fingerprints of his left and a flurry of decadent ecstasy, reverse the process.

The occasion was a seminar/workshop during which I witnessed a succession of presentations which demonstrated in lively if not hilarious ways, public speaking in the pits. So, as another of my sometime series for DPers on "How to Simulate an Effective Manager in Real Time," I am using this experience to address the topic "How to Keep Your Audience Asleep During an Information Explosion."

1. Organize a task force to plan the seminar, including representatives from competing areas of the business to ensure their "involvement." Have the members assigned full-time for six months and go ad hoc when the force tells you, a week before the meeting, that they are not clear on the objectives of the program.

2. Be sure the keynote speaker mixes with the audience just before the program begins and proclaims loudly, "I don't know how long they want me to speak, and I'm not altogether sure of the topic."

3. Sit the master of ceremonies way back in the last row so as each speech ends, he can waste a minute and half walking up to the podium, another minute getting the mobile mic clipped to his jacket and one last minute telling a dumb joke about walking up to the podium and clipping on his mic.

4. Try to distribute the clean-up equally among the speakers: one on the finger nails, one to brush the hair, one to pick at the beard, one to clean the lenses and so forth.

5. Require each speaker to precede his talk with a hokey ethnic joke. This tends to draw a curtain of silence over the crowd early and condition the

group for sweet dreams.

6. Ah, yes, prepared texts. Drill into the minds of the podium dwellers that substantive talks must be read from scripts, word-for-word, in wonderful monotone. Also that the voice level should gradually decay at the rate of about one soporific decibel per five minutes, so that when the speaker ends, he is practically whispering; this strategy is particularly important if the snooring is to be heard.

7. Then there's the handout. To illustrate the creative activity that goes into the seminar (or the lack thereof), try to make the various sections of the handout inconsistent in their appearance, as difficult as the task might be. You could try using different type fonts and unusual formats and even ones that don't fit the copies. This last tactic is always a crowd waker-upper and occurs at the beginning of those speeches affected, when attendees talk with their neighbors to see if their copies have the missing material.

8. With regard to slides, it's easy. On the screen, if I suddenly decay at the rate of trade, use "dark on dark" like gray on black or red on burgundy. The lack of contrast is arty, even though the slides are barely legible. And don't forget to complement the slides and text - for example, a couple of words on slide accompanied by 10 minutes of lecture or a complex schematic on the screen and a dozen words of explanation.

9. Get at least one presentation done professionally so it can stand as the model against which all others are measured.

10. Assemble a group of noble seers on the platform at the end of the session to answer questions, forget to plant shills in the audience, find no questions forthcoming and give a farewell speech to an empty room.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

THE TAYLOR REPORT/Alan Taylor

DP Crime Center Should Handle Harassment, Too

The National Center for Computer Crime is run by Los Angeles' district attorney, John K. Van Der Kamp. Visiting the center this summer, I found a little more than a filing cabinet - containing the bases for speeches and articles - and a telephone that hardly ever rings with requests for help or offers of information.

The center's title came from a junior district attorney's professional group a couple of years ago, rather than from any national demand or national support. When he agreed to support the center, Van Der Kamp acknowledged the computer's potential as a powerful partner in crime. This danger is no less present now, but the dangers of computer power go beyond crime into other activities - such as sending child support statements, in which Van Der Kamp himself is involved.

This danger presents a real problem, because a computer printout is hard to challenge effectively. It is also a pity that the crime center is so limited in scope. With a little imagination, another filing cabinet and slight change of purpose and title, the center could be a real and valuable fighter of computer crime - and computer harass-

ment and users to avoid answering criticisms properly and to evade responsibility for repeated errors in output.

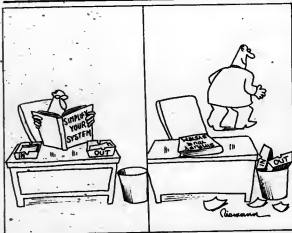
For criminals can take advantage of this irresponsibility to cover his tracks. As long as this is so, when there is no crime involved and when no apparent financial harm is done, then there will be somewhere for the computer criminal to hide. If this problem could be solved once and for all, however, it is a lot easier to track down computer criminals.

So what could be done to improve computer accountability? That is the real question the center should face and Van Der Kamp could help to address.

As perhaps all of us know, the mere assurances of humans in charge of computers that some particular error will be avoided in the future are often worthless. Communication with effectively responsible persons is rarely provided for. Especially when an error involves no financial loss, there seems to be nothing that can make an installation act to prevent repeated output errors.

Enter the Remors

There is someone in Phoenix who could tell Van Der Kamp and the Na- (Continued on Page 40)



Center Should Examine Harassment Complaints

(Continued from Page 39)
tional Center why something should be done to help people abused by computer errors even when no loss occurs. Robert W. Bemer has been receiving demands for child support he does not owe. The child support statements are issued by Van Der Kamp's office in Los Angeles. At the moment, the amount due appears to be \$53,572.08 plus service charges. I say "appears" to be, because the systems used by Van Der Kamp's office produce some of the most atrocious printing I have seen.

The latest demand is for \$54,643.52, which Bemer claims is \$1,000 off as the service charge is printed at \$71.44.

Actually, the service charge is set at 2%, or \$1,071.44 — but whether the absence of the "1" and the "0" from the form, indicates two non-existent characters in a correctly programmed computation or a wrongly truncated, zero-suppressed amount just cannot be seen from the output.

Bob Bemer and his former wife, Mary, are agreed that he hasn't owed any child support since July 1971, when their youngest child turned 21. The Bemer's want Van Der Kamp's records straightened out, both for their own peace of mind and for the benefit of the many people who know less about computers and who are subject to the same kind of abuse.

"I was considerably shocked. Who is responsible if I have a heart attack? I want to know: (1) Is there a warrant out for my arrest if I should come to California on business? (2) Are other people being harassed by this berserk and misprogrammed computer?"

Bemer does know something about computers. He happens to be the largely unacknowledged "Godfather" of Cobol — the man who 20 years ago this month, put aside his own interest in "Comtran" and joined with Grace Hopper in welcoming non-IBM and non-Univac English language compilers upon which to build the national and international language, Grace, of course, has received her due despite the disclaimers of authorship that had to be politically built in, but Bob's contribution has rarely been acknowledged.

On receiving the latest round of demands, after thinking everything had been put straight more than two years ago, Bemer was concerned — and not for financial reasons.

"I was considerably shocked. Who is responsible if I have a heart attack? I want to know: (1) Is there a warrant out for my arrest if I should come to California on business? (2) Are other people being harassed by this berserk and misprogrammed computer?" Bemer asked.

He has a point, and one on which Van Der Kamp could put his national center to work. How many false claims have been sent out after this system knew, or should have known, that the claims were false? How many other organizations don't listen to the people to whom they send demands? How do successful systems prevent erroneous demands?

If Van Der Kamp would send another filing cabinet down to that center and make it the National Center for Computer Crime and Harassment, he would get the support of many, many people for a worthwhile endeavor. By gathering together good and bad computer techniques, the center could become an effective fighter of computer-related abuses.

How about it, Mr. Van Der Kamp?

**Your VAX
+
Our PACS,
ILS & DACS
= MAX.**

STI

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Cause to Howl

In response to your recent request ("Howling at Moon," CW, Sept. 17), we see no real effect here of the moon on our machines or personnel. Our third-shift operator is so hairy now that if he does change the moon we would never know it. The other two operators show no effects at all.

The operations manager has not seen the light of day nor a full night's sleep in 10 years. One can only guess what causes his growling. The only thing of import that happens around the full moon is payday.

You may want to consider a study of the love lives of computers and copy machines. When the 9200 Xerox goes down, our IBM 360/50s go down; when it has the jitters, so do our CPUs. The peripherals are affected by the smaller Xerox.

Another interesting study might be on the effect of color on hardware. Our CPUs and tape drives are blue and the rest of the hardware is red. We have had a lot of hardware changes in the last three years, but the color scheme has been predominantly red. However, we have discovered that all the equipment that has given us headaches was originally yellow.

Another sure way to cause operations foul-ups or hardware problems is to say the two magic words "test time," such as when a programmer asks the forbidden question of the operations manager "Any test time today?"

When you consider everything else that happens, we should be thankful we are not affected by the moon. . .

Name Withheld by Request

Routing Algorithms

We believe that a number of assertions made by Murray Spitzer in "Algorithm Cuts CPU Time in Route Picking" (CW, Aug. 13) are either inaccurate, misleading or incorrect. In particular, he stated: "I believe I have developed the first generalized method of computerized schedule making."

During the past 10 years, we have designed and implemented a number of computer algorithms for the routing and scheduling of vehicles and crews. In addition, others have done much work in solving related distribution management problems.

Specifically, we have worked on such real-world problems as the routing and scheduling of garbage trucks for New

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LETTERS

York City, newspaper delivery trucks for a major newspaper in Massachusetts, school buses on Long Island, aircraft and crews for Federal Express vehicles for transporting the elderly and handicapped in a shared cab (or subscriber dial-a-ride) environment and tractor-trailers for a nationwide pharmaceutical firm. In many of these applications, the software has been installed on the client's computer and is

being utilized on a daily, weekly or monthly basis.

We have used a variety of algorithmic techniques (both exact and heuristic) that have differed significantly from Spitzer's approach, and we have been able to solve problems much larger than the 135-customer problem cited in Spitzer's article. For example, the Federal Express problem we studied involved more than 900 demand entities, the

newspaper delivery problem included almost 600 stops and the tractor-trailer problem close to 700 trips.

Spitzer's approach (generally referred to as "set covering" or "set partitioning" in the literature) has been used previously by Spitzer and others in order to solve scheduling problems. To our knowledge, nobody has been able to solve set-partitioning or set-covering problems with more

than 150 rows to optimality. Larger problems require a heuristic or approximate approach.

Spitzer did not mention whether his procedure is optimal or approximate in nature. Many of our algorithms and experiences have been published.

Michael Ball
Lawrence Bodin
Bruce Golden

College of Business
and Management
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The Structured Programming Surprise:

SOCIOLOGY OF COMPUTING/Robert L. Glass

It's been much more than five years now since the structured programming phenomenon hit the software world. In the spirit of a retrospective analysis, it's worth pausing to see what the whole thing has done for us.

There are a lot of ways of gaining that perspective and gauging that phenomenon.

1. Fortran and Cobol, the languages least susceptible to structured programming methodologies, still dominate the software world, although there are a swarm of preprocessors and textbooks which claim to inject structured capabilities into those languages.

2. Almost everyone still thinks structured programming is a good idea, or at least no one is speaking out loudly against it.

3. Those who make their living from structured programming look a tad worried. One consultant, in an article in Computerworld, called the transition to structured programming a failure and spent several columns explaining why the traditional technologies persist.

4. But the number of people who make their living that way is remaining pretty stable, and so is the profit picture. "Structured snake oil," as one consultant calls it, is still a lucrative sales item.

It's a mixed bag, then, from an objective point of view. The communicable disease GOTO has not by any means been eradicated (that's the bad news), but at least the incidence of the disease is way down and it's often contained and controlled (that's the very good news).

My favorite way of evaluating things, when objectivity boggles like this, is a little old-fashioned subjective storytelling. So here's the story which tells a lot about the workaday, pragmatics of structured programming and what might have happened to it along the way.

Hy Standard works in software quality assurance for General MPG, the leading auto maker. His job is to go out to software projects and look over the shoulders of the software application folk to see how they're doing.

If Byron Babylon's design document is too verbose and not focused enough, for instance, Hy (following his audit of the document) can demand that it be subjected to a crash and careful diet. Or if Nancy Nanosecond's code is clumsy and uncommitted, Hy (following his peer review of the code) can demand that it be shaped up and made self-documenting. Or if Sheldon Shelfpaper's configuration management practices are unmanageable, Hy can demand that order be restored to the chaos.

In short, Hy Standard looks out for the interests of the software users. It was when Hy was assigned to audit

the new application software for the new General MPG Camel line of cars ("They'll travel many a mile between gasoline oases") that Hy got his structured programming culture shock. What he found, in essence, was that there's many a slip 'twixt the documentation describing a software product and the product itself.

Michael McGoto was the lead programmer on the Camel software project. He was a little chagrined when Hy came calling one day, because having software quality assurance visit your development shop is sometimes about as much fun as a letter from the IRS. However, after a suitable recovery period, he cooperated to the hilt.

When Hy left Mike's office, he had a stack of supporting documents so high

that a grocery cart would have been the best way to haul them away. You might even suspect that Mike's cooperation was a little in the nature of a snowstorm, but that kind of suspicion is unfortunately paranoid (and, actually, unfortunately true!).

Hy, however, had battled his way through blizzards before. He shoveled aside the masses of uninterting and irrelevant information (Hy had come to call it the "Applehead and Mother Pig" data) and quickly got to the heart of the documents. And what he found there was admirable. The structured programming party line, to bring this story to its main theme, was impeccable.

The design study, the documents said, would be top-down. And so

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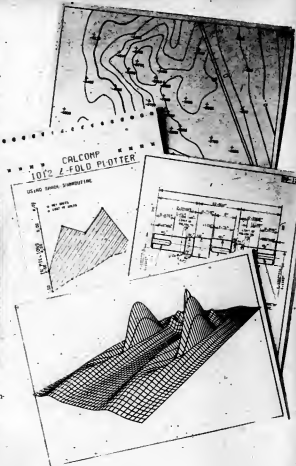


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would the implementation. A chief programmer team would be used. The librarian would maintain a program support library. The design would be represented in program design language.

Code would be controlled only by sequences of code. IF-THEN-ELSE, a multibranchCASE and a well-defined LOOP. COTO would be allowed, but approval would be necessary for each one from Edsel Rickenbacker, company president. Programmers who cheated on their GOTOs would be tarred and feathered.

It was, in all structured programming ways, an admirably conceived spec. The .TD-CPT-PSL-PDL concepts were all present.

It was when Hy got back to the im-

plementation specifics that his brow furrowed a little. And when he got back to the configuration management specifics, his brow furrowed a lot. Things were beginning to fail to add up.

For openers, the application was programmed in assembler language. How, Hy wondered, had Mike managed to play the IF-THEN-ELSE-CASE-LOOP game in assembler? For closers, the configuration management vault contained a plethora of test driver tapes. What, Hy wondered some more, did Mike need with test drivers if he was doing top-down implementation? The impeccable spec was beginning to look peaked.

Armed with an armful of doubt, Hy confronted Mike. He asked his pointed

questions—the very ones alluded to in the last paragraph—and settled back in his chair to wait for an answer.

Mike ahem'd a couple of times, as if he were trying to decide between a popular answer and an honest one, and then began speaking. To his credit, he had chosen the latter.

"To be honest with you, Hy," he said, honestly, "I don't think structured programming can really work. For instance, I know how to do structured coding in assembler. You invent macros for the IF and THEN and ELSE and for the CASE and the LOOP. Right? And then you use those macros to write your assembler code.

"But our macro assembler doesn't allow comments in macro definitions. And we have a project requirement for

heavily annotated code. I finally decided I'd rather meet the comment requirement than the structured coding one.

"And as for the test drivers—well, I just couldn't figure out how to top-down the implementation. I mean, I know you build a system nucleus, stub off all the incomplete sections and then write the stub replacements and integrate them into the nucleus. And I know that eliminates the need for integration tests and for test drivers. But when I tried it, half of my team was sitting on their thumbs waiting for something to do while the nucleus was coded and checked out. Finally, rather than see them idle, I told them to just get the job done.

"And we did, you know. We delivered the system on schedule and under budget." And Mike stopped his discourse to wait for a reply.

Top Software Trump

It was Hy's turn to shuffle uncomfortably. That on-schedule-under-budget finale was the top trump in the software game, and Hy's quality assurance cards, although potent, couldn't top it. Realistically, he knew he'd have to issue an audit report giving the software a passing grade.

"Did your management know what you were doing?" Hy asked, stalling a little while his thoughts whirled.

"Well, no," Mike confessed, "I tried to tell them a couple of times, but they kept saying, 'Spare me the details. Just do the job.' So I did. And we did."

Hy made a couple of notes on the pad on his clipboard, notes which he would put in his audit report. He put them about the fourth paragraph from the end, where hardly anyone would notice them, but he could point to them later if he had to.

"Damn fine job, Mike," he said, putting the clipboard under his arm and turning to leave. "You'll get a good audit report."

"They were both smiling broadly as Hy left the room.

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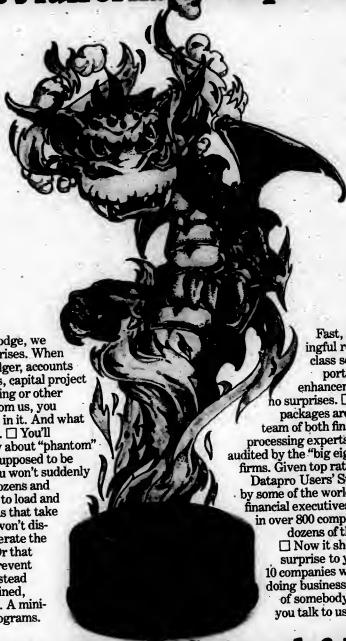


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Random Notes

Vendor Cuts Cost Of DOS Dictionary

LEXINGTON, Mass. — The Datamanager data dictionary package from MSP, Inc. is now available to DOS-oriented IBM shops for less than it was previously and for markedly less than what OS installations must pay.

A spokesman claimed the change in pricing is primarily a recognition that the smaller DOS shops need effective software but cannot justify the same level of expenditure as the OS centers.

The basic package now costs \$13,500 for OS users and \$6,100 for DOS sites, the company noted from 21 Worthing Road, Lexington, Mass. 02173.

Harris Phototypesetting Software Enhanced

MELBOURNE, Fla. — Software for Harris Corp. 7000 series phototypesetters has been enhanced.

Harris Typesetting System (HTS) 2.02 provides users with paper tape font modification and program update, as well as user-assignable density tables and on-line program switching.

The font modification feature permits changes to be made without having to "re-syngen" the entire system disk.

Harris is at 505 Rodes Blvd., Melbourne, Fla. 32901.

UCC Card Management System Updated

DALLAS — Version 3.0 of the UCC Asset Card Management System, the plastic card portion of University Computing Co.'s (UCC) automated teller machine (ATM) software, permits financial institutions to relate as many as nine applications to a customer's debit card account.

With the update, user institutions can also elect to permit multiple accounts of the same type — allowing, for example, access to more than one checking account through the ATM — at customer selection time.

With the update, card-holding customers is another feature of Version 3.0, the spokesman said for UCC Tower, Exchange Park, Dallas, Texas 75235.

In Dallas in December

CMG to Key on Management

By Don Leavitt
CW Staff

DALLAS — "Controlled Resource Management Through Computer Performance Evaluation" is the theme of the 1979 international conference of the Computer Measurement Group (CMG). Called CMG X, the meeting will be held at the Fairmont Hotel here Dec. 4-7, according to Robert Bishop, general chairman of Ernst & Ernst.

The program will consist of three parallel sessions encompassing performance management, technical sessions and tutorials. A vendor program con-

sisting of both exhibits and product presentations will also be part of the overall conference, Bishop said.

The performance management sessions will include such topics as basic concepts, implementation of performance management systems, measurement of user satisfaction, cost accounting and analysis of programmer productivity. The technical sessions will cover work load forecasting, IMS modeling, capacity planning and MVS performance.

In keeping with CMG tradition, the annual A.A. Michelson award will be made at the conference.

The Michelson award is given each year to an individual who has made significant contributions to the field of computer performance evaluation. Last year's winner, Dudley Warner, was commended for his pioneering work with hardware monitors.

The conference registration fee of \$165 — \$145 for preregistration — includes a copy of the proceedings and membership in CMG for the year 1980. More information is available from C.M. Edwards, Fredin/AY, 6118 Franconia Road, Alexandria, Va. 22310.

'CA-Driver' Aids DOS JCL Work

JERICHO, N.Y. — Problems associated with the management and control of JCL in the DOS/V5 (and later DOS/VSE) — Power environment do not necessarily push a center into OS. A center might instead consider installing CA-Driver, a JCL and job management system just announced by Computer Associates, Inc.

The package is said to provide total control, security and flexibility in JCL management as well as improve job scheduling and execution. Facilities that go "far beyond those available in OS"

provide for the maintenance and organization of JCL procedures stored under CA-Driver control.

Because JCL organization is managed by the package, the operator is able to spend more time running the system. This in turn should reduce reruns, a spokesman said.

The package supports nested procedures, permitting the user to isolate groups of statements that repeat within job streams. The number of job streams needed to support applications is reduced, and, with that reduction, JCL maintenance work is cut

down as well, he said.

Symbolic parameters allow the user to modify procedure statements dynamically at execution time, while support for conditional procedure expansion lets the user control the way in which a procedure is to be expanded in the face of specific conditions.

The package also has reporting facilities to document what is in the JCL data base. CA-Driver costs \$9,000 with various rental and lease plans available. Computer Associates said from 125 Jericho Tpk., Jericho, N.Y. 11753.

Package Manages Univac Tapes

ANAHEIM, Calif. — A magnetic tape management system that extends parts of Univac's OS/1100 to control tape use in real-time has been introduced by Formula Consultants, Inc.

The System for Tape Administration and Reporting (Star-1100) provides a tape inventory file (TIF) for use by the operating system on all Univac 1100 series CPUs. The TIF is on-line and therefore contains the current status of every tape reel, a spokesman said.

TIF can also be used to generate batch reports for use by librarians, programmers, and schedulers, he noted.

In common with various IBM-

oriented tape management systems, Star-1100 includes a vault management function that controls and schedules the transfer of tapes to and from locations other than the main tape library. Another function provides reports showing which tapes are due to be cleaned or recertified, the spokesman added.

He also said the vendor "strongly recommends" use of the package without gummied labels and with write-rings permanently left in all tapes. The TIF can provide all descriptive information normally found on gummied labels, and that information is available to the librarian at a terminal.

Unlabeled tapes can be protected by Star-1100, according to the spokesman.

Star-1100 supports use of OS/1100 tape expiration criteria as well as "several other methods" including tape cycle counts and "days after last usage." The package requires no change in the standard Univac control language syntax.

Star-1100 requires "only a few words" of resident memory; most functions are nonresident. The package costs \$12,500, with lease plans also available.

More information is available from Formula Consultants through P.O. Box 544, Anaheim, Calif. 92805.

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Whitlow Wanted to Know Experiment Shows Cost of SRB on Throughput

By Seu-Cheng Liu
And Dan Regan
Special to CW

One of the concerns today among computer users is the cost of various computer resources. How tasks compete for the CPU resource affects the total system throughput.

Under IBM's Multiple Virtual Storage (MVS) operating system, work is identified by two means: Service Request Blocks (SRB) and Task Control Blocks (TCB). SRB tasks have great "clout" with the CPU. They can demand and get more of the CPU's attention and resources than can TCB tasks. This often leads to a situation that might be called "SRB saturation." It is a condition that can have a serious impact on total MVS system throughput.

These are the conclusions drawn from a recent series of experiments conducted by some of us at Whitlow Computer Systems, Inc. Using an IBM 370/158-1, we set out to:

- Study the way in which SRB tasks and TCB tasks compete for the CPU's resources.
- Measure the impact this competition for resources would have on systems throughput.

Background Information

Before dealing with the experiment, some background information may be necessary. Just what are the basic differences between SRB tasks and TCB tasks?

Under MVS, CPU time is divided into two components: TCB time and SRB time. Of the two, TCB tasks are the more common; the work for

most tasks is scheduled with a TCB.

An SRB is a control block that represents a pending system request. This block, like the TCB block, identifies a unit of work to the dispatcher. Typical service requests are the post function on I/O completion and paging completion (see "IBM OS/VS2 System Programming Library: Supervisor").

When an SRB is scheduled, the system is made aware that a small unit of work is to be performed under the SRB. The system allows such requests to be dispatched at higher priority than TCB task work.

Naturally, the programs that benefit most from these facilities are those that contain independently dispatchable units of work which are required to run as single tasks in a multiprocessor system.

All service routines run under an SRB are entered in the supervisor state, enabled and unlocked. None are permitted to issue supervisor calls (SVC).

But perhaps their most important feature is that they are not preemptible. Although they are run enabled and subject to asynchronous interruption, under most circumstances SRB tasks will not lose control to TCB tasks until control is given up voluntarily.

It is this unique characteristic that distinguishes SRB tasks from TCB tasks. In the MVS hierarchy, SRBs enjoy the second highest priority, right behind I/O interrupt handling routines. This priority has a definite impact on the

execution of TCB tasks.

Assuming that TCBs usually run in the mean-time-to-wait group, we can conclude that an SRB will have greater impact on system throughput than a similar task running in TCB mode (see "IBM OS/VS2 System Programming Library: Initialization and Tuning Guide").

This point will become clearer when we consider the following: When a normal

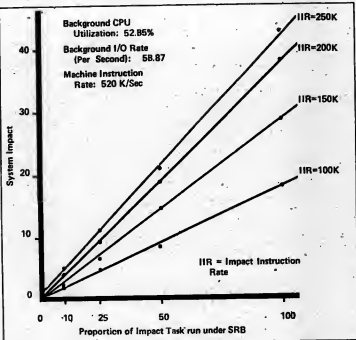


Figure 1

TCB task is entered into an I/O-bound system that is less than 100% busy, some of the task work can be executed when the CPU is idle. How greatly the task impacts the total system will, of course, depend upon the amount of wait time that is available.

If, on the other hand, an SRB task is dispatched under exactly the same conditions, it tends to saturate the system until its work is completed. Only one other function can preempt the SRB task: I/O and external interrupts. We therefore concluded that this SRB saturation should impact the total workload of the system.

The Experiment

To confirm this concept experimentally, we required two tools: a "controlled" workload and some means to measure system throughput. We could then determine the impact of an SRB or TCB by running the controlled workload with and without the task.

To simulate a general workload, we used a program called Multisim. The essential role of Multisim was to repeat the following code sequence: issue an EXCP for an I/O request; execute a number of MVC instructions; then issue an SVC WAIT for the completion of the I/O request.

By controlling the number of Multisims started and the number of MVC instructions between the EXCPs issued, we were able, to some extent, to

simulate the general workload.

With this procedure in mind, we defined "throughput" as the I/O rate of system that only runs Multisims. This provided a clear and measurable definition for "system throughput" and made it possible to define "system impact" as the percent change between the system I/O rate with an added task and without it.

Four types of background workload were created. On each background we imposed impact tasks with different instruction rates. We refer to the instruction rates of these various impact tasks as impact-instruction rates. We varied the proportion of impact instructions executed under both SRB and TCB modes.

The Findings

Figures 1 and 2 illustrate some of the results obtained at a machine speed of 520K instruction/sec. Both figures indicate that the detrimental effect of an impact task decreases as the proportion of instructions run under the SRB mode decreases.

Thus a routine executed under the SRB mode was shown to have greater impact than the same routine executed under TCB mode. The reason is that the use of an SRB allows MVS internal system components to structure themselves to run enabled, nonserialized and in parallel on multiprocessor systems.

(Continued on Page 48)

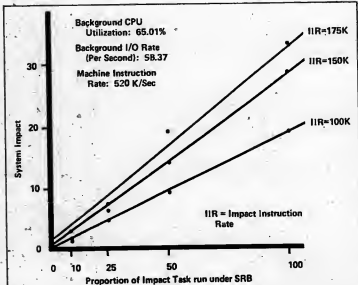


Figure 2

'Score' Update Adds Cobol Support Facilities

NEW YORK — Previously marketed as a Cobol source program generator and a generalized report writer, the Score package has been enhanced to improve the productivity of its users, whether they are on IBM gear or equipment from Burroughs Corp., Honeywell Inc. or Univac.

Score also has a new vendor behind

it: SDA Products, Inc. recently acquired rights to the package from Informatics, Inc., a spokesman said.

Developed and still primarily organized as a batch-oriented facility, Score generates source code, object code or load-and-go programs from nonprocedural parameters — supplemented, if the user wishes, by Cobol

statements and data definitions. Linkages to various data base management systems can be established, he added.

Score-V, the updated version, supports programmer and user productivity in two direct ways, SDA said. The modularity of the Cobol code generated by the system has been improved to provide more readable and main-

tainable programs. In addition, SDA had added CRT-oriented prompter features to allow on-line entry of Score parameters from terminals.

The prompters are only useful in a local terminal mode at present, but the possibility of support for remote programmer stations exists, especially since SDA acquired the rights to the Intercomm teleprocessing monitor, as well as Score, from Informatics.

A change in the basic function of Score, allowing the user to specify and get as many as 99 reports from a single pass of an input file, may prove an indirect benefit to the professional programmer, the spokesman noted.

Score-V costs \$25,000 and can be ordered from SDA at 260 Madison Ave., New York, N.Y. 10016.

Wang Users Get DTI Ledger Linkage

GRANTS PASS, Ore. — The Data Train, Inc. (DTI) is now offering a package that will serve as an interface between DTI's general ledger programs and competitors' software on CPUs from Wang Laboratories, Inc.

As its name implies, the DTI Journal Entries Transfer (JET) program No. 102 permits the user to transfer journal entries from competitors' programs to

DTI's ledger systems. This enables the user to update the ledger records — and the resulting financial statements — from existing sources.

JET operates in two modes: Detail mode transfers all journal entries, while summary mode transfers sum-

mary totals only, for each account.

Both the DTI ledger and JET operate on Wang MVP, VP, T and PCS II CPUs. Jet is available to DTI ledger users for \$40 and can be ordered from Suite 3, 840 N.W. 6 St., Grants Pass, Ore. 97526.

Editor Package Aids DEC Sites

BANGOR, Maine — Users working with Digital Equipment Corp.'s Timeshared Dibil (TSD) monitor under CTS-300 can now have full, on-line text-editing capabilities through the use of TEdit, according to that package's vendor, Futurenow Software.

TEdit is said to duplicate almost all the functions and to use the command structure of DEC's editor. It also supports command file processing and program chaining. Users can shift to the new software easily and gain new facilities once they make the change, the spokesman added.

Because TSD runs only Dibil-11 programs, text editing could only be done in single-user mode, with a dedicated system. TEdit allows concurrent text editing and normal data processing, the vendor claimed.

TEdit is available in Dibil-11 source code for \$300 on Diskette or \$400 on an RK05 cartridge, Futurenow Software said from 76 Smith St., Bangor, Maine 04401.

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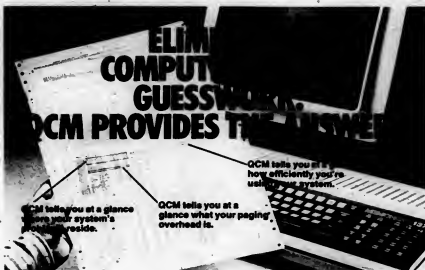
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'Condor' Backs Programmer With On-Line Development

SANTA MONICA, Calif. — An on-line programming support system that runs in IBM DOS and compatible environments has been introduced by Phoenix Computer Corp.

Condor was designed for use with IBM 3270 models 2 and 3 CRT terminals, enabling the user to develop and revise programming source code through a full-screen edit facility.

The Phoenix package includes asynchronous handling of multiple terminal requests so response time is independent of the number of terminals active in the system, a spokesman said. It also supports total system restart/recovery capabilities, he added.

In operation, the system supports a range of program editing functions including MERGE, FIND, CHANGE and DELETE commands. Sixteen levels of system security are provided, as is a capability that allows users to edit as many as 10 different source modules simultaneously from a single terminal, the spokesman claimed.

Remote job entry facilities support

the user in a variety of ways. Job submission, display of reader, printer and punch queues, entry of Power/V5 and DOS/MVT Save queue control commands, Program Function (PF) key utilization and reports on resource utilization are all available, the spokesman said.

Phoenix emphasized the interfaces it has with CICS, Task/Master from Turnkey Systems Inc., Shadow II from Allergo Software, Inc. and West from Westinghouse Electric Corp., as well as linkages to Pervasive from Pansophic Systems, Inc., The Librarian from Applied Data Research, Inc. and IBM source statement libraries.

Condor runs under DOS/360, DOS/V5, Edos from The Computer Software Co. and DOS/MVT from Software Pursuits, Inc. Users of DOS/360 and DOS/MVT can get the software for \$300/mo.; V5 and Edos users are charged \$325/mo., the spokesman said from Suite 3010, 3420 Ocean Park Blvd., Santa Monica, Calif. 90404.

'SGD' Builds Dictionaries

DENVILLE, N.J. — Intended for Cobol-based IBM 360, 370 and 30 series installations, the Self-Generating Dictionary (SGD) package from Haverly Systems, Inc. builds a data dictionary data base as it analyzes user source programs. It also creates and maintains an external cross-reference list that contains all data usages within all user programs known to it.

These are actual usages as they appear in the Procedure Division of a Cobol program, a spokesman said, adding that SGD automatically takes care of situations when different programs refer to a particular data element by different names.

In order for SGD to make such resolutions at the data element level, the user must identify which files and records are in fact the same, even if they

appear in different Data Divisions under different names. Given that information, the package can analyze the users' source programs correctly, the spokesman reported.

While matching of varied element names is important to establishing the basic cross-reference list, SGD's ability to recognize indirect references to data is equally important for programmers working on maintenance projects, he said.

The system's identification of the kind of usage — is the data merely accessed or is it changed? — in a given program is also important for maintenance work, the spokesman noted.

SGD costs \$9,600 for DOS and DOS/V5 shops or \$14,500 for OS-based centers from 78 Broadway, P.O. Box 919, Denville, N.J. 07834.

Tests Show Cost of SRBs

(Continued from Page 46)

MVS structures the system's tasks in descending order of execution priorities: interrupt handling and processing of pending I/O requests, service routines, and, finally, TCB tasks.

Using an SRB to perform the function of service routines — such as the I/O post function — instead of having such routines executed disabled and serially allows faster reuse of a channel. It also permits earlier start of pending I/O requests.

Additionally, the high dispatching priority of an SRB allows the task waiting for I/O completion to be posted as soon as possible.

While tasks requesting SRB service benefit from SRB's high priority, other tasks with lower priorities suffer. Although the impact on these other tasks is not as great as if the SRB tasks were executed disabled and serially, it is greater than if they were executed under the TCB mode.

Thus the execution of SRBs tends to saturate the system and reduce the I/O rate of other tasks — except for interrupt handling and the processing of

pending I/O requests. Conversely, TCBs tend to use idle processor time and — if there are no I/O contention — they therefore create less interference with other tasks.

It should be noted that under actual operating conditions the impact of TCB tasks with I/O requests should be greater than those measured in our experiment. Our TCB subtasks were artificially constructed as CPU-bound tasks so we could compare their impact with SRB tasks. This effect has, however, been recognized by the inclusion of the I/O rate in the calculation of service units by the Systems Resource Manager and by most of the job-accounting systems.

Having concluded that the impact of an SRB on system throughput is greater than that of a TCB, we faced the next logical question: What can the MVS user do to ensure against SRB saturation and the resulting loss of total system throughput?

Regan is the manager and Liu the technical leader of Whittow Computer's special project team.

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Service Firms, User Ease Shift From 1401 to 370

By Howard A. Kerten

CW Staff

MEMPHIS, Tenn. — There's nothing particularly unusual about an insurance company that uses an IBM 370 as its main computer. But there are two unusual aspects to DP operations at Lincoln American Life Insurance Co. here: the computer is 700 miles away, and the company converted to the 370 after using an IBM 1401 for many years.

"The 1401 was in a service bureau in our building. We deluded ourselves into thinking that the [1401] was more economical, because as we looked at our other options, they all seemed more expensive. The thing we neglected to look at was the indirect costs of additional people — the [1401] was so labor-intensive," according to E.R. Lindner, senior vice-president for administration at Lincoln American.

The company decided to take an in-depth look at its operations and began a study of alternatives in 1973. That led to a \$1.5 million, two-and-a-half year project, which culminated with the decision in March 1977 to use a service bureau, in Austin, Texas. That company, TCC, Inc., uses a 4M-byte IBM 370/158.

Cooperative Effort

Converting to the 370 was a cooperative effort on the part of Lincoln American and TCC, Lindner explained. TCC furnished a project manager, and the two companies worked closely on the effort.

The software is owned by TCC, although Lincoln American has the option to purchase it at any time. If TCC should cease business for any reason, the contract between the two companies states that the insurance company will then own the software. That was done to protect the company, Lindner said.

Although the conversion effort was lengthy and arduous, — primarily because of problems encountered while converting the firm's data base from the 1401 — the long-distance effort has given the firm problems. It uses a Four-Phase Systems, Inc. IV/40 system with a card reader and printer and 12 CRT terminals for data entry. All its jobs are scheduled in advance.

"We initiate jobs here, by terminal," Lindner explained. "TCC sets up jobs, and we keep our forms here and print the output. The leased line [to Austin] costs us under \$1,000 per month. When we're not communicating data over it, we use it for voice."

Although the company had only been using the system a short time when Lindner was interviewed he felt that cus-

tomers had noticed little difference in the firm's DP activities.

"We're using completely different forms, and we've had to stuff flyers or explanations in the things we send [customers] to alert them that they are new forms. We've had to communicate with our agents to let them know ahead of time what's coming, so that when policyholders call them and ask what's going on, they

[will be] educated and know what it's all about," Lindner said.

Easy Transition

Converting to a new system was easy on the service bureau, according to Lindner. The service bureau with the 1401 was alerted to the switch early on and cooperated with the firm offering service on the 370.

"We phased them out

slowly, carefully, and they picked up other customers along the way, and they're happy. Their service continued adequately all the way through this thing and they came through beautifully, because we leveled with them. We were right up front, and they were cooperative," he recalled.

Employees, too, have reacted well, he claimed, despite the fact that some were displaced

by the new system. "They're beginning to see what the system can do for them and how easier it is to use."

The firm will help the displaced employees make the transition, Lindner noted.

"They knew that we were going to make it as easy as possible, and try to help those we can't retain to find other jobs. That's helped — we didn't just kick them out on the street," he said.

Pascal Coding Aided

SAN ANTONIO, Texas — A combination coding and CRT layout form to speed software development and documentation for Pascal programmers is now available from Stirling/Bekdorf. The form is marked to show coding indentations and CRT display limits, a spokesman said.

The coding sheets, identified as 78C1-P, also provide a five-column field for line numbering. Although Pascal does not require such identifications, programmers — especially

those working in teams — have found them useful both in writing operators' manuals and in communicating with others about program logic, he said.

The 78C1-P is marked to show both 16- by 24-char. and 24- by 80-char. CRT screen sizes.

The sheets are available in packages of 100 forms (two pads of 50) for \$26.85 plus \$3.25 for handling from Stirling/Bekdorf, 4407 Parkwood, San Antonio, Texas 78216.

Enhanced 'P-Stat' Version Gains Conversational Mode

PRINCETON, N.J. — P-Stat 78 from P-Stat, Inc. is a large conversational system offering file maintenance and data display features, cross-tabulation and "numerous" statistical procedures across a wide range of mainframes and operating environments.

An internal editor simplifies the building and execution of P-Stat runs, a spokeswoman said. Prompting, help messages and other support facilities are provided to enhance the interactive

use — a new capability — of the systems, which may also be used in batch mode, she noted.

Data can be displayed in tabular listings, plots, frequency distributions and histograms. Cross-tabulation options include percentages, means, "side-by-side," new and n-way tables. Revised formats for some of the cross-tab procedures are among the enhancements in P-Stat 78, according to the spokeswoman.

Statistical capabilities available to the user include chi-squares, F-tests, T-tests, standard deviations, regressions, principle components or interactive factor analysis, backward-stepping multiple discriminant analysis, Pearson product moment correlations and Manova and matrix commands, she continued. P-Stat is written in Fortran with a few small machine language subroutines for character manipulation. The software has been implemented on IBM 360s and 370s under various operating systems; Digital Equipment Corp. Decsystem-10s and 20s and VAX-11/780s; Burroughs Corp. large-scale systems; Univac 1100s and 90/80s; Control Data Corp. Cyber equipment; Honeywell, Inc. 6000s; and Prime Computer, Inc. 400s and 500s.

P-Stat is offered on a yearly lease basis at \$5,000 for the first year and \$2,000/year thereafter.

More information is available from P-Stat at P.O. Box 285, Princeton, N.J. 08540.

TRS-80 Gets Basic Tool

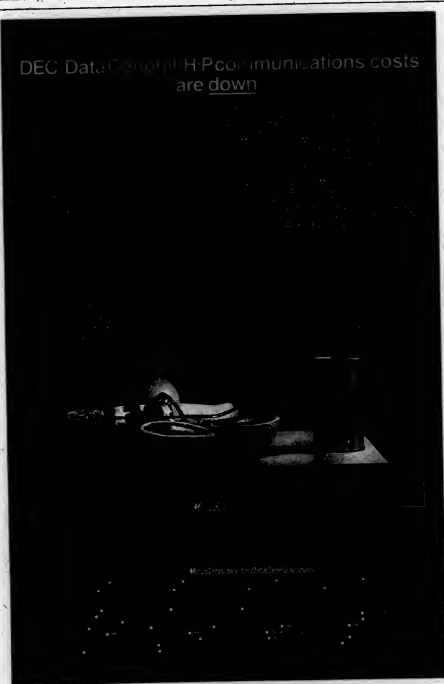
PUCHHEIM, W. Germany — The Basic-SP generator was written to create structured programming in Basic on the Radio Shack Corp. TRS-80 and other microcomputers, according to the vendor, ESZ Germany.

While Basic is typically considered a tool for people without heavy experience in programming, even Basic programs can get complex enough to obscure their logic. Basic-SP provides the structural advantages of language like PL/I and Pascal without imposing their disadvantages, a spokesman said.

The programmer controls the generator with interactive commands and reserved Basic comments. Commands such as IF, ELSE, IEND, CASE and CALL are available to the user.

The generator can be used with 8K bytes of random-access memory and is compatible with micro- and minicomputers which use Microsoft Corp.'s Extended Basic. Distributed in a cassette, Basic-SP costs \$419. ESZ Germany said from Herbsistrasse 35, 8031 Puchheim, W. Germany.

DEC Data Communications costs are down



IBM Terminal, Printer Designed for Multisite Users

WHITE PLAINS, N.Y. — IBM introduced its 3101 CRT terminal and associated 3102 printer, both aimed at businesses, schools and other organizations that require many CRT sites, when the vendor's color graphics duo — the 3279 display station and 3287 printer — debuted recently [CW, Oct. 8].

The 3101 can communicate with IBM 370, 4300, 8100 and Series/1 systems, a spokesman stated.

Also able to work with Tele-type Corp. devices, the 3101 can display up to 1,920 char. in 24 lines on its 12-in. screen. The 3102 printer attaches to the 3101 to provide hard copy of the CRT display. The printer can be returned to an

IBM repair center if problems cannot be resolved by the operator, the spokesman stated, noting that both the 3101 and 3102 contain self-diagnostic functions.

Control Unit

IBM also introduced its 3274 Model* 51C control unit, which can reportedly attach to as many as 12 CRTs or terminals. The unit's cost starts at \$7,300. Its monthly charge under a two-year lease is \$170; rental is \$200/mo.

The 3101 CRT terminal costs \$1,295 to \$1,520, depending on the interface and transmission mode selected. Price reductions of 7.5%, 15% and 20% will be applied to purchases of 25 to 49 units, 50



The IBM 3101 terminal, shown here in an engineering version, was designed to be set up quickly and easily in locations such as offices and schools where space is limited and many sites need CRTs.

to 99 units and 100 or more units, respectively.

The 3102 printer costs

\$1,295, but a 7.5% reduction is applicable to purchases of 25 or more units.

Government Role in R&D Debated

By Jay Woodruff

CW Staff
CAMBRIDGE, Mass. — What role, if any should government assume in promoting or regulating progress in data communications?

Panellists at MIT here recently had different answers to that question, but agreed that research and development in remote processing technology is, for the moment, proceeding at an adequate pace. The meeting was sponsored by MIT's Research Program on Communications Policy.

The government threatens to discourage innovation in communications R&D with its policy on equipment depreciation rates, according to Dean Gillette of Bell Laboratories, Inc. Unless equipment subject to taxation is allowed to depreciate at a rate considered fair by its owner, the incentive to acquire additional equipment for advancing the state of the art may decline, he

warned.

The Communications Act of 1934 was "a good act when it was written," Gillette observed. But the legislation hinders tech-

nological progress by neglecting to account for the advent of digital computer systems, he said.

In what Gillette termed a "plug" for keeping the Bell Sys-

tem whole in the face of threats from government to divide it, the AT&T official indicated the development of telecommunication.

(Continued on Page 54)

TI Cuts Prices on Three Terminals

HOUSTON — Shortly after four terminals joined Texas Instruments, Inc.'s Silent 700 product family, the Lone Star vendor cut prices on three 700s already delivered: the Model 743 keyboard send/receive (KRS) terminal; the Model 743 receive-only (RO) printer; and the Model 745 portable terminal.

Effective immediately, the 743 KRS's tag is down to \$1,195 from \$1,395; the 743 RO's cost has dropped from \$1,195 to \$995; and the 745 goes for \$1,695 instead of \$1,995. Those changes entail savings of 14%, 16% and 15%, respectively.

Earlier this month, TI unveiled a four-member 780 series of ter-

minals [CW, Oct. 8] that now cost a few hundred to about a thousand dollars more than the 740 units.

The 740 price slashes will be effective on unshipped backlogs,

Burroughs Adds WP Gear

YAPHANK, N.Y. — Burroughs Corp. has introduced a family of word processing (WP) systems and a line of optical character recognition (OCR) page readers for communications with remote CPUs.

The vendor's R III editing stations can be placed on any office desk or workstation, a spokesman claimed. The CRT and key-

board are said to move independently, allowing operators to adjust components to comfortable working positions.

Up to 30 lines, or half a page, of text can be shown on the Burroughs R III screen in normal display mode. For "close editing," 15 lines of copy are displayed in the product's "magnify

(Continued on Page 54)

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Panelists Debates Government Role in R&D

(Continued from Page 53)

tions services in the U.S. could be hurt if the Bell-System splits up.

Today, planning for telecommunications services is carried out by intercity and intracity carriers," he explained. Breaking up Bell might reduce cooperation between carriers by inducing rivalries analogous to those between the various branches of the U.S. military.

According to ITT's Lynn W. Ellis, government may be pushing communications R&D too much overall, but should exercise the right to ask companies to develop something if they fail to try to meet government needs. "Other than that," he said, "why should government get involved?"

But Gerald Deneen, an Assistant Secretary of Defense concerned with telecommunications, suggested the private sector should be spending more on R&D.

Overseas Perspective

From overseas, a different perspective came from the University of Tokyo's Prof. Hiroshi Inose. In Japan, where a number of critical resources are in short supply, the government pays for one-fifth of R&D in communications and information science, he stated.

However, Inose said Japan "does not realize the importance of information resources development." He would like to see Japan's government increase its financial support, while demon-

strating "leadership to avoid duplication of effort."

On another front, Ellis, who had just returned from the International Telecommunications Conference in Geneva, Switzerland, said the merging of digital and telecommunications technologies is partly the result of falling prices in computer hardware.

The phenomenon has put the trend toward integrated services at odds with traditional practices of telecommunications management, Inose observed. Like those who drafted the 1934 Communications Act, some telecommunications managers have yet to appreciate the impact and opportunities of computing.

Management should recognize that digitized communications is becoming

more labor-intensive and less capital-intensive as it becomes more software-oriented and less hardware-oriented, Inose added. This situation, created by falling hardware costs and the advent of powerful software systems, means the importance of managing people is likely to grow faster relative to the importance of managing equipment.

Inose also noted that framers of network implementation policy should resist the tendency to build systems with capabilities for which there is little demand.

Building a network where there are few information resources is "like building a superhighway where there aren't any cars," he concluded.

TI Terminals Get Price Cuts

(Continued from Page 53)

reductions to "innovations in manufacturing technology. As manufacturing and production methods are streamlined and improved, costs can be reduced while maintaining high-quality standards, and it is TI's philosophy to pass those savings on to the user."

The 743 and 745 terminals use a TI-developed thermal print head to deliver 30 char./sec. performance. The Model 745 can be linked to a host CPU via its built-in acoustic coupler and standard telephone lines.

TI can be reached at P.O. Box 1444, M/S 7764, Houston, Texas 77001.

Burroughs Adds WP, OCR Gear

(Continued from Page 53)

mode," the spokesman said.

Operators can scroll through a "page" of text up to 121 lines long.

The shared printing and dual sheet-feeder capabilities Burroughs announced in June for its R II diskette WP equipment are available with the R III line. A separate power supply for the R III's 55 char./sec. printer allows the printer and CRT station to be operated as far as 40 ft. apart.

Available Features

Format and editing features standard on R III equipment include automatic centering; formatting and format revision; automated hyphenation; word wraparound; normal, decimal and flush-left tabbing; selective retrieval of information segments from diskette; store and recall; search and replace; and document assembly.

Employing telephone lines or public exchange networks, the R III word processors can handle transmission speeds as fast as 2,400 bit/sec. with general-purpose lines and up to 9,600 bit/sec. with dedicated lines, the spokesman stated. The equipment operates in either batch or interactive modes from diskette media or the system keyboard.

Entry-level dual-disk R III systems cost \$9,595. Other versions cost \$11,500 and \$13,500. More information is available from Burroughs at N.Y. Horse Block Road, Yaphank, N.Y. 11980.



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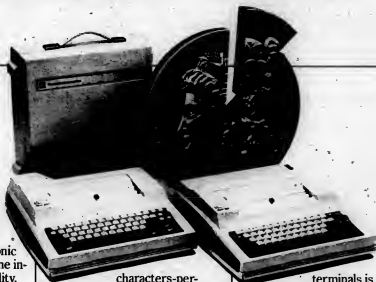
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For more information about our lower-priced *Silent 700* Models 743 and 745 Electronic Data Terminals, contact the TI sales office or authorized distributor nearest you, or write Texas Instruments Incorporated, P.O. Box 1444, M/S 7784, Houston, Texas 77001 or phone (713) 937-2016.



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FCC Soliciting Comments On AT&T's Rate Structure

By a CW Staff Writer

WASHINGTON, D.C. — The Federal Communications Commission (FCC) is soliciting comments on alternative approaches to regulating — or deregulating — AT&T's private line rate structure and volume discount practices.

The "processing of AT&T filings is complicated by the excessive number of AT&T's tariff schedules, the failure of the company to use consistent technology and definitions in the tariffs and the use of inconsistent rate structures for determining rates for functionally similar services," the FCC stated.

"These problems may be due in part

to a simple failure to revise tariffs necessary to keep them current with technological change and to coordinate new tariffs with existing ones," the FCC said. But "this complexity among tariffs [has] impeded the FCC's ability to review them as well as the ability to make informed choices between competitive services."

The commission is seeking through rounds of comments. The first round would pertain to its tentative conclusion on the "lawfulness" of AT&T's current private line rate structure and volume discounts.

The FCC plans to study AT&T proposals for revamping private line offerings while it ponders the first round of criticism. A second round of comments will then be solicited to obtain responses to the AT&T proposals and any counterproposals.

Finally, a third round of comment will be sought "primarily to allow AT&T and other parties to reply to its counterproposals," the FCC explained.

The first round of comments is due Jan. 7. Deadlines for the second and third rounds are Feb. 22 and March 2 respectively. FCC headquarters is at 1919 I Street, N.W., Washington, D. 20554.

Joining Regulatory Council

In other FCC news, the commission has joined the U.S. Regulatory Council, an action that should make regulations affecting data communications more accessible to users.

The action also indicates heightened federal interest in the economic impact of what the FCC does. President Carter created the council in October 1978 "to inform the public and Congress about the cumulative impact of regulations on the national economy," FCC spokesman noted.

The FCC "is deeply committed to the goals of the council — the improvement of the federal regulatory process — and intends to work closely with other federal agencies to meet that challenge," according to Charles J. Ferris, FCC chairman.

The council is intended to include federal executive departments and agencies with major regulatory responsibilities. To inform the public the council publishes the "Calendar of Federal Regulations" at least every 3 months, the spokesman said. This directory reportedly cites the goals and benefits, legal requirements and estimated economic impacts of regulations.

Columbia Data Offer: Add-On Storage Unit

COLUMBIA, Md. — Users of decentralized systems can add more storage with Columbia Data Products, Inc. Z80-based Model 400 communication storage unit.

The 160M-byte Model 400 is said to perform file management, forms entry and editing tasks and handle transmissions as fast as 19.2K bit/sec via a RS-232C interface.

Prices start at \$1,995. Columbia is located from 9050 Red Branch Road Columbia, Md. 21045.

Each earth station consists of a dish antenna 16 ft in diameter and pointed at a satellite 22,300 miles away in space and a small walk-in electronics shelter. The stations send and receive business and technical data in the form of electronic pulses that are exchanged at a rate of 56,000 pulse/sec. The communications link is described as a full-duplex, 56K bit/sec channel.

The third station in the DSS satellite network will be operational by the end of the year at the Central Data Systems Center in Fort Worth, Texas. The fourth station is expected to go on-line next year in Sanford, Fla.

Versatec Printer/Plotter Gives Video Hard Copy

SANTA CLARA, Calif. — Within 20 seconds after appearing on a raster scan display, "archival-quality" hard copy can be in a user's hands with the video hard-copy system announced recently by Xerox Corp.'s Versatec subsidiary, the vendor claimed.

Said to feature a 6 page/min computer graphics and 132-column print at 1,000 line/min, the Versatec 1641A

system consists of two modules: a floor-standing electrostatic printer/plotter and a desktop or rack-mountable video interface. The printer/plotter reportedly offers a resolution of 160 dot/linear in.

When a terminal operator requests hard copy, the 1641A can deliver up to 15 copies per request and then return to computer-directed work, a Versatec spokesman said. One system can support up to

eight terminals.

The printer/plotter and video interface can be separated by a distance up to 1,000 ft if a special "long line" capability is included, the spokesman added. An optional Hard Copy Request Unit provides remote control up to 1,000 ft from the system's controller.

The system accepts video signals conforming to Electronics Industries Association standards RS-170, 330, 343A,

375A and 412A as well as various Consultative Committee on International Radio (CCIR) standards, the spokesman noted. Options allow composite synchronous and external clock inputs.

In print/plot mode, the 1641A's parallel input interface accepts ASCII print code or plot data in the form of unweighted 8-bit bytes at burst rates up to 1 Mbit. An RS-232C serial interface is said to

operate asynchronously in receive-only mode at user-selectable rates to 9,600 bit/sec.

Electrographic paper is available in interchangeable roll or fanfold, yielding a cost per copy of less than 3 cents, the spokesman maintained.

The Versatec 1641A costs \$10,500 in the U.S. and \$13,725 overseas. Versatec's address is 2805 Bowers Ave., Santa Clara, Calif. 95051.

TI Changes Lease Rates On Omnis

HOUSTON — Texas Instruments, Inc. has slashed lease rates on two packages of the Omnis 820 keyboard send/receive (KSR) terminal and added a leasing package for Omnis 810 receive-only (RO) printer.

The 820 KSR ASCII package includes the basic 820 KSR unit and a 128-character ASCII set with 18-key numeric keyboard, compressed character printing, device forms control, mounted paper tray and Bell 202/212 data set cable. That package now leases for \$100/mo on a 12-mo plan.

The 820 KSR ASCII package includes the basic 820 KSR and ASCII keyboard and character set with 18-key numeric keypad, compressed character printing, device forms control, mounted paper tray and 202/212 data set cable. The package can now be leased for \$110/mo on a 12-mo plan.

Now on Lease: 810

Further, TI is offering another leasing plan for the basic Omnis 810 printer, 128-character ASCII set, vertical forms control, compressed character printing, mounted paper tray and Electronics Industries Association standard interface.

The 810 features optimized bidirectional 150 char./sec impact printing, a 9 by 7 dot matrix character font and multiple copy printing.

Under a 12-mo plan, that 810 package leases for \$128/mo.

TI can be reached at P.O. Box 1444, M/S 7784, Houston, Texas 77001.



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Wiley to Chair Network Conference

WASHINGTON, D.C. — Former Federal Communications Commission Chief Richard E. Wiley will chair the Communications Networks '80 conference scheduled Jan.

28-31 at the Sheraton Washington hotel here. Fifty conference sessions and about 200 exhibition booths will be featured at the show. It was originally scheduled to

run Jan. 28-30, but The Conference Co., its sponsor, added an extra half-day session Jan. 31 to cover electronic mail.

Other topics scheduled for discussion include new developments in telecommunications technology, system networks and administrative networks. The program will include panel discussions on new markets for electronic mail and home communications services. Problems of

worldwide communications operations will also be discussed.

The full conference costs \$345. Registration for Jan. 28-only or Jan. 29-only sessions costs \$145. The Jan. 30 session, which includes the half-day session Jan. 31, costs \$175.

The fee for the exhibition only is \$10, the Conference Co. said from 60 Austin St., Newton, Mass. 02160.



Richard E. Wiley

Network Seminars Planned For Boston, San Francisco

LOS ANGELES — Data network users will be told how to make networks more responsive to user needs and how to lessen their dependence on system vendors at two Technology Transfer Institute seminars this fall.

"Experts on Networks," slated for Boston Nov. 7-9, will feature discussions by Leonard Kleinrock, professor of computer sciences at the University of California at Los Angeles; Howard Frank, president of Network Analysis Corp.; and Lawrence Roberts, chairman and president of CITE Telenet Corp. and a key designer of the Defense Department's Arpanet.

49765, Los Angeles, Calif. 90049.

'Computer Networks'

Kleinrock will also teach "Computer Networks," which will be held in San Francisco Dec. 2-8. This course will cover packet switching, resource sharing, teleprocessing systems and network evaluation and design. Technology Transfer said.

Each seminar costs \$675, which covers all documentation, lunches and breaks, the institute noted from P.O. Box

Tymnet Extends Packet Network To South America

CUPERTINO, Calif. — Tymnet, Inc. has extended its packet data communications network to Argentina.

Entel, the Argentine telecommunications agency, will install a Tymnet communications processor to provide direct communications to both the Tymnet and Telenet Communications Corp. networks via the international facilities of ITT World Communications.

First to Tymnet

This action will make Argentina the first South American nation to offer data base access to Tymnet, according to a Tymnet spokesman.

As a result, Argentinian organizations and Argentinian subsidiaries of U.S. corporations will be able to communicate directly with home-office CPUs linked to Tymnet in the U.S.

Tymnet is headquartered at 20665 Valley Green Drive, Cupertino, Calif. 95014.

From the Graphics Leader



Infotron Enhances Supermux 780, 480 Abilities

CHERRY HILL, N.J. — Infotron Systems Corp. has added data compression capabilities to its Supermux 780 statistical multiplexer and given its Supermux 480 the ability to interface directly with common carrier current-loop lines.

The 780 replaces multiple telephone lines with a single, higher speed facility. Using statistical techniques, the device transmits only active inputs without wasting band-

width on idle terminals, a spokesman stated.

The technique is said to render two to four times the throughput of conventional time-division multiplexers.

The data compression capability recently given the 780 reportedly provides additional savings to the user, especially with inputs carrying tabular data. According to Infotron, tests have shown compression rates approaching 45%.

Each compression channel includes a microprocessor and a buffer separate from the 780's central processor and buffer, the spokesman explained. Incoming data is compressed using a special Infotron algorithm and statistically multiplexed with other 780 inputs.

The receiving Supermux then reconstructs the data so the compression and the multiplexing is transparent to

the user's software and terminals.

The Supermux 780 also reportedly eliminates transmission errors. Data is temporarily stored in the central buffer while a cyclic redundancy check is performed. When errors are found, the data is retransmitted and rechecked, the spokesman continued.

Sufficient buffer storage is provided so data loss is averted even with outages

lasting 10 sec on a fully loaded 9,600 bit/sec line, he claimed.

The 780's new compression channels are said to handle dial-up or dedicated asynchronous inputs at 13 switch-selectable speeds in the 50- to 4,800 bit/sec range.

Automatic baud rate (ABR) detection is provided for the compression channels, which reportedly recognize the speed of dial-up inputs, eliminating the need for separate speed dedicated lines, computer ports and telephone rotaries.

Supermux 480 Link

Infotron's enhancement of the Supermux 480 statistical multiplexer entails the adoption of current interface input adapters that plug into external connectors on the 480. The adapters may be added on an individual line basis to units already in the field, the spokesman said.

The Supermux 480 is used to reduce data communications costs by concentrating up to eight transmission lines over a single, higher speed facility, the spokesman continued. Inputs may be any combination of dial-up and dedicated asynchronous lines at mixed speeds as fast as 9,600 bit/sec.

The 780 compression module costs \$450. The current interface option for the 480 costs \$50 per channel. Infotron is located in the Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Dip Introduces Impact Printer

BOSTON — Dip, Inc.'s Model 80 impact printer features 7 by 7 or 14 by 7 dot matrix printing, upper and lower case character sets and 100 char./sec bidirectional operation.

The Dip 80 is aimed at mini- and microcomputer users for commercial educational and scientific applications. The printer outputs 80- or 96 char./line on 8.5 in.-wide paper.

Interface options include Centronics Data Computer Corp. — compatible parallel, RS-232C serial and 30mA current loop. The Dip 80 costs \$475 in OEM quantities from Dip, 210 Lincoln St., Boston, Mass. 02111.

Tektronix 4027.

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Short Communications Class Set in Eight Cities

MADISON, N.J. — A "short course" in data communications systems will be given by the American Institute for Professional Education in eight cities between now and Christmas.

Directed by Kenneth Sherman, president of Info Comm, Inc., and Ben McCandless, an independent consultant, the course will cover the basic elements of a data communications system, types of transac-

tions, satellite considerations, communications media, carriers and regulation and network services.

The course will also address code sets — such as Baudot, Ebcidic and Ascll — and data encryption techniques as well as validity checking, line protocols, terminals, central site hardware, cost analysis trade-offs and support methods. "After completing the course, attendees will be able

to participate in projects involving data communications and converse with experts in particular facets" of the field, an institute spokesman said.

Course Sites

The course will be given in Chicago, Oct. 24-26; New York, Oct. 31-Nov. 2; San Francisco, Nov. 5-7; Dallas, Nov. 12-14; Milwaukee, Nov. 28-30; Boston, Dec. 5-7; Ft. Lauderdale, Fla., Dec. 12-14;

and Phoenix, Dec. 19-21.

Registration costs \$495 per person, but 10% discounts apply to three or more registrations from the same organization.

The American Institute for Professional Education is located in the Carnegie Building on Hillcrest Road, Madison, N.J. 07940.

DES Critic Hellman to Give Course on Cryptography

STANFORD, Calif. — "Data encryption is now the

cheapest, most convenient and least disruptive method for ensuring the security of data communications and storage," according to Hellman Associates, which plans a four-city tour of seminars on the subject.

Stanford University Prof. Martin Hellman, a developer of public key encryption methods and a leading critic of the federal Data Encryption Standard (DES), will talk on "Cryptography and Data Security" in Washington, D.C., Oct. 29-31; Dallas, Nov. 7-9; New York, Dec. 10-12; and Los Angeles, Jan. 28-30.

Course Outline

The course outline includes coverage of the growing commercial need for encryption; the different types of cryptographic attacks; public key and signature systems; what cryptography cannot do; "classical" cryptographic systems; and pseudo-random number generators.

Also scheduled for discussion are IBM's encryption systems; the strengths and weaknesses of the IBM-developed DES algorithm; and relevant topics in complexity theory.

Registration costs \$595 per student, including lecture notes, texts and lunches. Hellman Associates is based at 730 Alvarado Court, Stanford, Calif. 94305.

Modem Works On Coaxial Cable

RIDGEFIELD, Conn. — Computrol Corp. has released its Model 30-0078 coaxial cable modem, which reportedly transmits and receives asynchronous data on coaxial cable at rates as fast as 2M bit/sec.

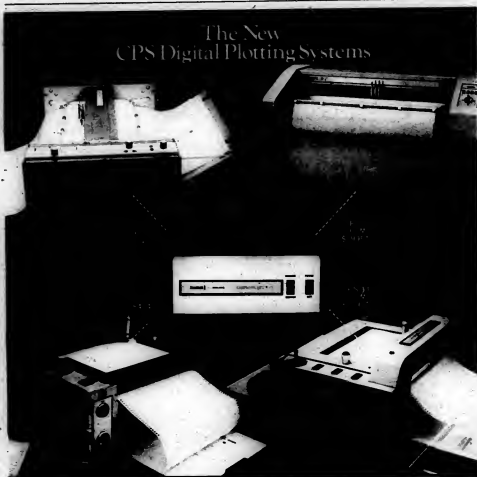
The modem allows the implementation of a single high-speed data highway for interprocessor communications.

Distribution Aid

It also permits remote multiplexing of distributed I/O functions, the networking of terminals and CPUs and the movement of large packets of data in local area networks, a spokesman said.

Costing \$240 in quantities of 100, the Model 30-0078 can reportedly transmit over distances up to 50,000 ft without amplifiers or repeaters.

Computrol is at 15 Ethan Allen Highway, Ridgefield, Conn. 06877.



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generation of alphanumeric characters, circular buffer memory and greatly simplifies host computer software. The controller can either operate from a host computer or serve as a sophisticated computer interface — whichever fits your specific application.

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For complete information on the new CPS Digital Plotting Systems, call or write Houston Instrument, One Houston Square, Austin, Texas 78758, (512) 837-2820. For rush literature requests or sales office information, persons outside Texas call toll free 1-800-531-5025. In Europe contact Houston Instrument, Rochesterian 8 8240 Gistel Belgium, phone (059) 27 74 45.

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Not Just Minimum Requirements RFP Format Lets User Weigh Desirables

By Marcy Rosenberg

TALLAHASSEE, Fla. — Users seeking to acquire computer systems through competitive bidding procedures should quantify not only mandatory, or minimum, requirements, but also place cost values on "desirable" features in their requests for proposals (RFP).

By coming up with an objective way to evaluate and credit vendor bids that exceed minimum specifications, users can better identify the lowest total cost proposal.

That advice was offered by Robert Ippolito, director of the DP Division of the Florida Department of General Services (DGS), which worked with the Florida Department of Highway Safety and Motor Vehicles (DHSMV) to develop an RFP for an on-line DP system.

The RFP was recently revised and put out for rebidding following a hearing involving bidders IBM, Amdeh Corp. and Intel Corp. [CW, Sept. 10]. The second RFP, valued at about \$9 million, calls for a five-year lease of equipment and software with an option to purchase after the 60-mo period.

Ippolito is also vice-chairman of the Standards Subcommittee of the National Association of State Information Systems (Nasis), which has two primary objectives: first, to develop standard terms and conditions and acceptance criteria for state and local government contracts, and second, to develop a model RFP.

Formulas to Modify RFP

With the charter of the Nasis subcommittee in mind, Ippolito and other DGS staffers have helped DHSMV modify its RFP to include several formulas for measuring and attaching cost values to "desirable" criteria for system availability, reliability, maintainability and price/per-

formance.

Calculation of these formulas will be based on the past performance of each bidder's equipment in those four areas. To do this, the RFP requires each system during the period from June 1978 to May 1979 that are similar to what will be bid.

In the area of system availability, the RFP asks for a minimum 95% uptime, with greater than 95% "desired." The cost function formula for availability will be

computed as follows: (Total vendor installment purchase price plus 60 mo. maintenance cost) times (one minus the average percentage of the 10 users' system availability levels) equals cost added to bidder's cost proposal.

By this formula, a vendor whose equipment has in the past provided greater than 95% uptime will have less cost added to its bid — 1.00 minus .95 yields a higher multiplier than, say, 1.00

minus .98.

Similarly, for systems reliability, Ippolito helped devise a cost function formula that would credit the vendor whose equipment demonstrated the least number of system failures per year, based on user data.

To develop this formula, DGS computed the median average recovery time after system failure of computer equipment currently in use at DHSMV — a Burroughs (Continued on Page 66)

Power, Maintenance Problems Constant in 'Boonies,' User Finds

By Tom Henkel

CW Staff

With an unreliable supply of power and an intermittent run-time problem, a DP manager in a small midwestern town is convinced that operating in the "boonies" is really roughing it.

"We're crashing an average of 25 heads a month on our disks and we're getting wrong linked records in the middle of our tapes," one operator said.

"We're also losing data and spending most of our time rebuilding packs. We had to get a bigger CPU just to keep up with the stuff we had to run," he added, referring to the site's recent upgrade from an IBM 360/50 to a 360/65.

The organization, a farmer's co-operative, has been trying for the past six months to resolve its problems. IBM was called in to check the 360/65 and reported nothing wrong. Sorbus, Inc., under contract to service the IBM peripherals, was also called. It too, found nothing wrong.

Disgusted with both companies, the co-op is looking for a software consultant in hopes that some professional hand-holding will solve the problems. Reluctant to worsen an already

strained relationship with both service groups, the DP manager asked that his firm not be mentioned by name, but he was willing to share his story.

Power Problems

It all started with power problems, he recalled. "Everything would malfunction. One day a back hoe was digging up a cable

in one part of town and it caused a glitch. Another time a student at [the local university] got angry with his cable TV line, cut it and it fell across the electrical line causing an outage.

"The worse problems came when a truck hit a power pole and knocked the lines down. The lines got crossed and all kinds of (Continued on Page 66)

Move to T&M Contracts Can Save DP Dollars

By Jack O'Connor

Special to CW

I took a cost-cutting gamble with my company — and survived to tell about it.

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Other readers may be able to benefit from our approach if two

conditions apply to their installations: (1) if they have hardware that is at least two years old, and (2) if they pay separate monthly maintenance fees (i.e., if some hardware was purchased).

The key to the approach is to ask yourself a basic question: "How likely am I to have a catastrophic repair bill for my DP equipment?"

Maintenance 'Insurance'

In my shop, a standard cost associated with all of our hardware purchases and rentals is a monthly maintenance fee. For (Continued on Page 70)

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DDP: Whys and Whens — Part 4

Central Control Advised in Distributed System

By A.L. Scherr

Special to CW

Last week, we discussed redistributing the terminals in an on-line banking application as a solution to the problem of growth. That solution — adding more nodes to each node in the updated system — handles fewer branch banks — would increase the miss ratio, thereby increasing the communications overhead.

This increased overhead would add to the load of the system, and still more capacity might be required.

If more nodes were added to solve this problem, the resulting increase in the communications overhead might totally offset the increased capacity. In this way, the situation might degenerate to the point where no number of nodes would be able to handle the required load.

Another simple solution to the problem would be to use machines that have greater processing capacity in each node. This alternative is sometimes not attractive because of the economics of replacing existing equipment.

If neither faster equipment nor the simple extension of the distribution

bottlenecks and predicting effects of new applications and/or redistribution of data and programs.

Most importantly, perhaps, there has to be a level of compatibility between the nodes of the system to allow for both data and program redistribution to support growth. Compatibility must exist, even between dissimilar nodes, for the following items: support programs, communication protocols, transaction definitions, portable media and data structures.

This is the last article in a four-part series.

Where, How to Distribute

These articles have discussed some theoretical aspects of systems design as well as the pragmatic motivations for seeking distributed processing solutions to application implementations. Theoretical considerations do not usually dictate where or how to distribute. They can only assist in maximizing the efficiency of decisions based upon criteria as systems reliability and availability, data security, organization needs and response time.

If, for example, a machine is being placed near a manufacturing line to provide insulation from central system failures in the area of work scheduling, there are very few degrees of freedom with respect to the placement of certain data and where certain programs must execute.

The overall importance of the factors that determine the form of processing (distributed, centralized or decentralized) to be selected begin with such motivations as have been described. Considerations proceed to the structural requirements of the application data and programs and continue to the various choices described in the techniques sections of these articles.

Distributed processing offers an unprecedented level of flexibility in the design of application systems. Because flexibility is inevitably a two-edged sword, however, it is more necessary than ever before to proceed with understanding and with deliberate, manageable plans. It is for this reason that the cornerstone of any effective distributed processing system must be the ability to proceed with a high degree of centralized control.

This article has been condensed from "Distributed Data Processing," which originally appeared in the IBM Systems Journal, Vol. 17, No. 4, 1978, and appears with the permission of that journal.



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CHALLENGE BY CHOICE

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RFP Format Lets User Evaluate Desirables

(Continued from Page 61)
B6700, an IBM 370/158 and 370/168 and a Univac 1100/42, 1100/81, and 1100/12. The median came out to 10.02 minutes, or 167 hour.

Another component of this formula was "hourly systems cost," computed by adding the vendors' installment purchase price and 60-mo maintenance cost and dividing that sum by the product of 720 hour/mo

times 60 months.

The 720 hours is the maximum usage of a machine running 24 hours a day, 30 days a month.

Using these calculations, DGS developed a cost function for systems reliability:

- Average number of system failures per year (taken from user data, times hourly systems cost, times five years, times .167.

For systems maintainability,

DHSMV plans to apply the following formula to each bid:

- Number of preventive maintenance hours per year (taken from user data), times hourly system cost, times five years equals the cost for preventive hours.

Here again, the vendor whose equipment has historically required the fewest number of maintenance hours per year would have the lowest cost for preventive hours

added to its bid.

Finally, DGS came up with a cost function to rate the price/performance of each bid, based on DHSMV's benchmark test. To pass the benchmark, the RFP requires a mandatory, or minimum, speed of 10 transaction/sec, but 15 transaction/sec is "desired."

Based on Auerbach data, DHSMV then selected machines within its price range that could perform a mini-

mum 10 transaction/sec. These turned out to be either an IBM 3033, Amdahl 470 V/6, Univac 1100/84 or Burroughs B7800.

The agency then calculated the average cost to upgrade these machines to perform 15 transaction/sec. That figure came to \$100,000.

Vendor Credit

To credit vendors whose equipment exceeds the mandatory requirement during the benchmark test, a formula was devised as follows:

- 15 minus the number of transaction/sec (using DHSMV test data), divided by 5, and then multiplied by \$100,000.

Thus, a vendor bidding equipment that performed closest to the 15 transaction/sec speed would have the lowest price/performance cost added to its bid. A vendor whose machine could actually perform 15 transaction/sec would have no extra cost tacked on to its cost proposal (15 minus 15 equals zero).

Vendor Benefits Claimed

Ippolito maintained these procedures offer benefits to the vendor as well as to the user because each bid is evaluated on the same basis.

Moreover, because these formulas help to ensure that the lowest bid will likely be the system that exceeds minimum requirements in the areas of maintenance, price/performance, reliability and availability, "vendors are encouraged to offer the best performance for the lowest cost," he added.

Asked why DGS didn't just elevate DHSMV's minimum requirements to its desired level — such as making 98% uptime mandatory — Ippolito explained that this would spur vendors to bid more expensive systems in higher performance brackets.

No Easy Task

He admitted that developing objective cost measure for "desired" performance features is no easy task, and that as a result, most users "assume all vendors will perform equally in areas such as reliability and availability, based only on verbal commitment."

DGS' first attempt to place cost value on "desirables" in an RFP was put to the test on Sept. 28, the closing date for the second round of bids. Depending on how effective the cost formula criteria are in getting DHSMV the kind of equipment it wants, Ippolito will propose that these formulas be part of the Nasit model RFP for state and local governments.

He also suggested that these criteria "can be applied in any equipment acquisition process — even by commercial users."



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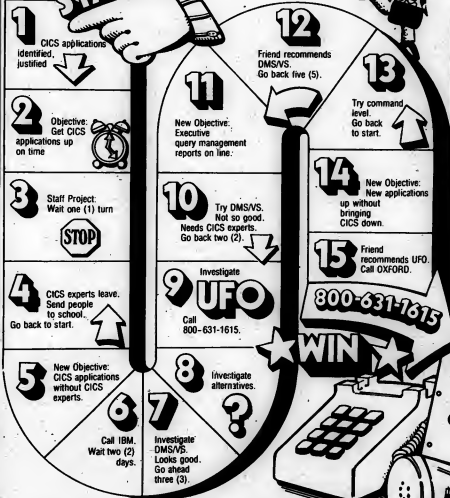
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With Faster Response, Same Staff Upgrade Helps User Double Sales in Four Years

By Ken Schlosser

Special to CW

WATERBURY, Conn. — An upgrade four years ago, from punched-card equipment to a Univac 90/30, helped my company, MacDermid, Inc., improve its position in the highly competitive specialty chemicals industry.

While we are still a considerable distance from having the ultimate information system, our hardware and software have enabled us to respond more promptly to business demands. And four years after we began updating our information gathering and reporting techniques, we have the same size staff to deal with substantially more systems and data.

Our sales have doubled in

the past four years to more than \$42 million. But such success would be transitory if we couldn't react quickly to customer inquiries and demands, manufacturing requirements, marketing priorities, financial needs and management requests.

Today, we can access information on our system within minutes. Four years ago, our reaction time was measured in hours — and sometimes days. As might be expected, the oldest user in the firm is the accounting department. In addition, we can enter data captured on cassettes for other departments. Eventually, when terminals are placed in more locations, we will be able to expand the system.

Surprisingly, we have found

that an increasing number of unique requests come from the marketing department. And recently, sales management has moved more heavily into forecasting and has asked us to project pricing effects during the next year, via sales models.

More Detailed Reports

An example of our success with the system is a monthly report we use to examine gross profit margins for our products. The report now gives us information on 770 products in 100 categories. This summary would have been too cumbersome to assemble manually. Although we had bot-

tom-line figures, we never had the details.

Another report we use provides the sales manager with a profitability statement, sorted by customer. It balances gross margins against costs to produce adjusted grosses in both dollars and percentages.

In the future, we plan to generate a 12-month moving average of sales by customer. This will smooth out the peaks and valleys in our sales figures, so we will be able to question month-to-month fluctuations.

By October, we hope to have a working order entry/inven-

tory control system. And some time after that, we hope to establish a distributed processing system in Los Angeles, giving our laboratory staff the ability to write their own programs and have direct access to the system.

Our first exposure to the system's capabilities came when we decided to maintain an index-sequential customer file in interactive mode. Within a few hours, we were able to begin file maintenance. The time savings in both the systems and operations areas were substantial.

Schlosser is director of management information services for MacDermid.

Problems Found Worse in Boonies

(Continued from Page 67) things happened with the power," he said.

Living with power outages becomes a way of life in the country. "It's a big part of our problems," the manager notes. "We've had six power outages in September alone. Who knows what kind of residual effects those things have?"

After failing to find problems in the CPU and peripherals, the co-op now plans to investigate the software and operating systems. An in-house consultant is the best investment the firm could make to solve its problems, the manager believes.

"We've grown so dramatically here that a lot of things haven't caught up with us. Our growth has used up our capacity. Whenever you're right at the edge of your capacity, every problem is a catastrophe," he said.

Wearied by six months of problems, the DP manager said he is disgusted with both IBM and Sorbus. But he's not blaming them.

"The hardware people aren't quite prepared to do the whole job. It really takes your own software expertise to really dig [the problems] out," he said.

Last Resort

If a software consultant fails to remedy the co-op's problems, the last resort will be a new system. The DP manager said he is looking toward a supermini that can accommodate the 360 operating system and software and yet be more reliable than the 360.

The co-op will take "the first supermini that can meet our goals. I don't care whose name is on the box," he said. "If we can throw out the big monster, we'll do it."

"We want the latest technology in a miniaturized form. I'm ready tomorrow, but I fear it will be a long, long time in coming. But the longer we

wait, the worse the maintenance problem is because of inflation and the [shortage of] available [maintenance] people."

"The computer is still a practical machine only in the big city; and that's true of communications, too," he said. After six months of checking and rechecking the hardware, the DP manager is now convinced the problem is either in the software or the operators.

Challenge of Change

Operators insist the disk drives are at fault, but their boss disagrees. "We have IBM 2314 drives. On the drives where disk packs aren't changed very often, we don't have problems, but where they are changed quite frequently, we do," he said.

"Some claim [the frequency of change] shouldn't make a difference. But experience seems to indicate otherwise. Unless you handle them like eggshells, they're not for frequent changes. I don't blame the operators; nobody can handle them like eggshells. Even if you could, contamination might cause problems if you changed them frequently," he said.

"We are disgusted, but the truth of the matter is, the only users that are satisfied with maintenance are those without problems. If everything works perfectly, your maintenance is great."

Although Sorbus has a customer engineer at the site and IBM has one in town, it can take up to three hours for IBM to send someone, one operator said.

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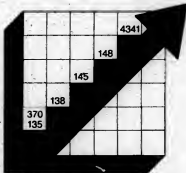
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Switch to T&M Contracts Can Save DP Dollars

(Continued from Page 61)

purchases, the maintenance charges range from 5% to 1.5% of the original purchase price per month. That's what most of us pay now for this function.

It is our "insurance" that if any major malfunction occurs with the equipment, the vendor will repair it, regardless of the cost.

How can you tell whether to replace a monthly maintenance contract with a T&M contract? You probably have enough information readily available to you to answer this question.

Most hardware vendors require that good records be kept on each machine by the customer engineers who repair them. And most customer engineers keep their records on-site, near (perhaps inside) the equipment. Why not use that valuable information?

Quarterly Time Periods

Examine the prior two years and add up all the hours recorded in quarterly time periods. I suggest a two-year minimum and quarterly time periods for the following reasons: you need a fairly broad base, not a snap-shot picture of your maintenance costs; for any equipment that you've had for less than two years, it's too soon to evaluate any trends; after 24 months, all major hardware flaws should have shown up; and eight quarterly periods should show you any trends if they exist.

When you have gathered this information, ask your hardware vendor

what your quarterly costs would be under a T&M contract. A good rule of thumb to use in evaluating these costs is that parts costs should equal labor costs.

Therefore, you should double labor cost to yield the total estimated cost for repair under such a contract. Then compare this to your maintenance costs during the same time period.

Switch to T&M?

Now comes the gamble. Should you switch from monthly maintenance to T&M? The answer is yes, if:

- There is a significant cost reduction—probably on the order of 50%.
 - The T&M way shows level costs or a gradual decrease in costs as time progresses.
 - There are no catastrophic increases in any single time period using T&M.
- All three of these conditions should be met if the switch is to prove successful in the long run. On the other hand, you should not switch if any of the following statements are true:
- The T&M method shows only a slight savings, since there are several variables involved. (Does the cost of materials, in fact, equal labor costs? How do current rates for T&M compare with actual costs for monthly maintenance?)
 - The T&M time period analysis shows a trend of increasing costs. It could be that the equipment is reaching an age when replacement would save more than repair under any contract.

• One or more time periods show a drastic increase over the quarterly norm. Again, equipment reliability might be suspect, unless you are aware of extenuating circumstances.

Suggested Adjustments

Your initial calculations might need some adjustments. What kind should you look for? Almost all of the following are based on your vendor's maintenance policies:

Is travel to and from your site included in the quoted rate? If not, where is the base from which he will travel?

Have your vendor's labor rates been fairly steady over this same time period?

Are the vendor's material prices exorbitant?

What hours are covered under a T&M contract?

Are you reasonably sure that the vendor will continue to handle your maintenance calls as promptly under T&M as it did on a monthly fee basis?

Is there a minimum charge per call? Did you have a large number of calls that took only a short time to correct?

T&M Candidates

There are four pieces of moderately priced equipment that show few breakdowns. In descending order of likelihood for T&M contracts: there are modems, communications processors, little-used unit record gear and CRTs.

On the other hand, the following

equipment (listed in order of most likely to break down to least likely) will show more breakdowns, although they can be replaced at a low cost: tape drives, data entry equipment, disk drives and much-used unit record equipment.

If you look at the nature of these two groups, you can see that the equipment types that are best suited for T&M contracts are either all-electronic, with few mechanical parts, or seldom-used mechanical equipment. CPUs may also be considered for T&M contracts because they experience few breakdowns, but their prohibitive cost makes them a poor risk.

We have instituted this approach so far on our two pieces of unit record equipment. At the moment, we are studying the possibility of extending it to our modems; if that works, we'll extend it further.

I am confident that as time passes and hardware vendors continue to improve the reliability of the equipment they market, the T&M method will become more prevalent. Unfortunately, I also envision the vendors compensating for lost monthly maintenance revenue by significantly increasing the hourly rates charged for customer engineering.

For the present, though, if we carefully evaluate the reliability of each hardware device we are currently using, we anticipate saving some DP dollars with very little risk.

O'Connor is supervisor of data processing with Grove Manufacturing Co. in Conway, S.C.

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On-Line System Energizes Radiology Reporting

KALAMAZOO, Mich. — An on-line system for reporting radiological results has reportedly helped Borgess Hospital here save \$2,000/mo, significantly reduce the time needed to get reports and improve productivity in typing reports.

The 462-bed community hospital had been experiencing a time lag between the time when radiological exams were given and the time when the results were reported to nursing floors and referring physicians. The reports were dictated, transcribed onto both memory and conventional typewriters and returned to the physicians, according to George Guziewicz, department man-

ager.

After this review by the physicians, they were retyped if necessary and taken to a central facility where copies were made for distribution and filing. The overall process required a minimum of six hours and sometimes took as much as 24.

"When reports were being processed, they were difficult to find," Guziewicz recalled. "Calls would come in requesting results, and we would spend time looking for reports in typing or physicians' offices or the central reproduction facility." As a result, there was a need for a system that would speed up processing and retrieval.

To solve this problem, a system was developed to run on the hospital's IBM 370/138 using CICS and a modified version of general-purpose software called Source Program Maintenance On-Line II (SPM-OL-II). As a start, an existing computerized radiology patient index was integrated into the reporting process.

CRT Efficiency

When a patient registers at the hospital, his name is entered via a CRT terminal to see if the patient had been admitted previously. If so, the relevant information is displayed on the CRT screen. If not, a manual card file that had been used is checked; but in any case, data for the patient is entered into a computerized index.

When radiologists examine a pa-

tient's X-rays, the information is transcribed on a terminal. The patient record can be accessed by a unique, six-digit number assigned on admission.

The terminal operator proofreads the report on the CRT, making any corrections necessary. The report is then simultaneously stored in memory and reproduced on a hard-copy printer.

Once it has been entered in the system, the report can be easily retrieved by the radiology department, which presently inputs 40 to 50 report inquiries a day. These reports are maintained on the system for about six weeks, according to Guziewicz, and then archived on magnetic tape.

If radiologists wish to make any changes in reports during their review, they use the terminals. Any revised reports are printed out and distributed as necessary to the patient's record jacket, referring physician and any other place where they are needed.

"Report-typing productivity improved by 15% as a result of this system," Guziewicz said. "We have eliminated the need to handle paper. In addition, corrections are made more simply, eliminating the need to completely retype reports."

"Typing errors are substantially reduced because typists can more easily see what they are typing on the CRT screen," he commented. "Previously, an average of 12 reports a day had to be retyped. Now there are only about two."

The savings of \$2,000/mo is based on a decrease of 96 hours of typing per month (a savings of \$270/mo in copying costs alone) and a reduction of 140 hours/mo spent looking up and copying reports, Guziewicz explained. "As a result, the system not only paid for itself in three months, but gave us the capability to process more reports in the future without a proportional increase in staff," he added.

Discipline Enforced

As a side benefit, the system has been enforcing greater discipline on patient records in terms of consistent identification of patient names and doctor names and addresses, he commented. Further, the morale of radiology department personnel has improved because of the ease of data entry and manipulation and faster availability of information.

"Once the reports are in the system, recall is good," Dr. Leonard A. Brunette, chief of radiology, said. "The format is well-accepted and filing personnel are able to operate much more efficiently since these units permit rapid retrieval and location of the X-rays."

The hospital is investigating the possibility of installing additional terminals in new areas, such as the emergency room. This would permit emergency room personnel to get quicker access to reports on X-rays, Brunette noted.



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From Three Systems to One Front-End Planning, Teamwork Easing Switch

By Howard A. Karten

CW Staff

PITTSBURGH, Pa. — A concentration on front-end planning, the involvement of top management and a conversion team dedicated to that purpose are combining to help a user here replace three separate systems with one.

The Heinz U.S.A. division of H.J. Heinz Co. has already eliminated one of its two Univac Series 70 (see RCA Corp. Spectra 70/45) systems and swapped its IBM 370/125 for a larger, 1M-byte 370/148, according to Bill Lape, general manager of information systems for the division. Although one purpose of the conversion was to save

money, Lape was unwilling to spill the beans on exactly how much the company will save.

When the conversion is finished — a target currently scheduled for December — the company should be able to process its data more cheaply as well as more flexibly, according to Lape and other company officials.

Before the conversion process began, the company had the two Spectra systems, the 370/125 and a network of IBM 3790s. "We recognized [that there would be] a tremendous saving by rolling the three mainframes into one. The staffing alone of one CPU vs. three had implications for savings. Also, we had flat-out hardware cost re-

ductions not only from rental, but also the maintenance of three pieces of gear," Lape explained.

"It was a major decision for us, but we recognized that considering all the variables, it was the only way to go," he added.

Looking at Options

When the firm recognized this, it began considering its options. After looking at some 60 issues that seemed relevant — such as cost, flexibility and modular growth — the company decided to get an IBM 370. That left only the choice of which model.

To make that decision, Lape and several of his staff went to an IBM facility

in Palo Alto, Calif., and went through a hardware planning session lasting three days. "We actually sped out and built a little model of our operations and evaluated where we should be. That ended up [looking as though] we would need a 158 or 3031-level system," he recalled. However, he opted initially for the 148.

From January through April of 1978, we went through a major conversion planning effort. For example, we went through our inventory to determine what we had as far as programs and systems: What did we have to bring over? What was obsolete? Jack Fryer, project manager for the effort, recalled.

"We did this by looking in the Spectra source library and by interviewing users knowledgeable with the systems. Then we wrote a program to scan the source documentation and print out that material." That resulted in a 30% reduction in the number of programs to be converted, from 1,339 to 990.

The first Spectra system was taken out of service in December 1978, which left the second Spectra targeted for a September 1980 removal. At that point, however, Fryer, Lape and Tom Ohare, manager of computer systems for the division, began considering accelerating that goal to December 1979.

"There were two variables — either decreasing the amount of time allotted for each task or increasing the staff. We decided to increase the staff by one. From five to six of our people, and to bring in two contract programmers," Fryer said.

Almost all of this conversion effort was accomplished without the use of software conversion aids. Ohare explained. Other users with whom Heinz had spoken mentioned that such conversion aids might well create additional problems. It also helped that virtually all the Spectra programs were written in Cobol.

Different Perspectives

Not surprisingly, Fryer, the project manager, Lape, who is overseeing the entire effort, and Ohare, the manager of computer systems, have somewhat different perspectives on the most difficult part of the task.

"The most important thing to look for in doing front-end planning is to make as few hardware changes as possible. We were upgrading everything, which caused some confusion in the early part [of the effort], although everything has fallen into place since then," Fryer stated.

"If you're smart enough, and lucky enough, to spend the time at the beginning and have a good plan, and follow through, and don't rush it — it's easy to rush the project and say, 'Let's just convert and do the documentation later' — that's the most important thing," in Ohare's view.

"One of the big problems was our own impatience," Lape said. "We knew from our [regular] project experience that the way to do it is a lot of front-end planning — but you always want to see the action, the visible results. We said, 'We're going to invest in the planning side' — and it's turning out that we've been able to accelerate [the original] schedule with an absolute zero cost."

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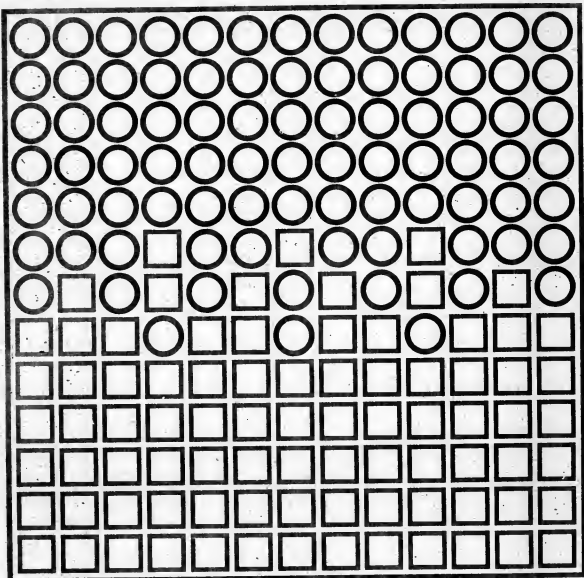
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Computer Corporation of America

Info 79: A Conference Dedicated to End Users

By Jay Woodruff

CW Staff

NEW YORK — The 1979 version of the six-year-old Information Management Exposition and Conference (Info 79) is aimed primarily at "the end user of the end products" of information management, according to conference organizers.

The four-day conference, which begins here today at the New York Coliseum, will feature 80 sessions and about 250 speakers. It will also give attendees a chance to walk through an exposition of information management products.

The sessions have been divided into four conferences of general interest covering DP management, advances in the technologies and office automation. In addition, Info 79 will offer separate "conferences-within-a-con-

ference" for those with specialized interests.

These specialized conferences are aimed at marketing executives, small businesses, financial managers, banks, insurance companies, manufacturers and others who want to improve the productivity of their offices, according to an Info 79 spokesman.

The conference, which is the work of Clapp and Poliak, Inc., an international exhibition and conference management firm, will include eight conferences-within-a-conference. Topics range from financial, marketing, small business and manufacturing systems to insurance, banking, hospital and law office systems.

As many as 170 exhibitors of hardware, software and peripherals — primarily the latter two — will exhibit their products concurrently with the

sessions. The exhibits are on the first and second floors, while the sessions run on the third and fourth levels, the spokesman indicated.

Info should not be confused with the National Computer Conference, held here in the same location in May. Info is designed for management-level people, he explained.

Info is billed as the "only show that covers the entire range of data processing, word processing and office automation equipment." Practical applications and problem solving take precedence over the hardware, however, according to Clapp and Poliak. "This show really shouldn't be compared with NCC," the spokesman added.

What makes the show unique, he continued, is that "it divides itself according to your needs. A banker might prefer to go to the banking systems

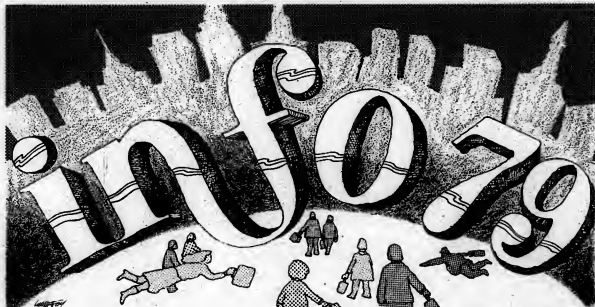
conference, but if you work in marketing for a bank, you might prefer to go to the marketing systems session. It all depends on your primary interest."

Start-Up Sessions

Each of the conferences will begin with start-up sessions to give attendees an overview of what the conferences will cover. The start-up session of "Advances in Information Technology," for example, will discuss multiple minicomputers as mainframes.

For the conference on DP management, project management techniques and standards for DP will be discussed, while trends in the design and application of marketing information systems will be the focus of the sessions on marketing systems. Information management conference attendees

(Continued on Info/4)



A Key to the Keynotes

By Jay Woodruff

CW Staff

NEW YORK — The technology for the information systems of the 1980s is here today, but how can we use it to provide the kind of information management we need?

Edward A. Schefer, keynote speaker for the Sixth International Information Management Conference (Info 79), said in a recent interview that management efforts in strategic planning will be "incomplete and not accomplishable without effective information systems support."

While top management has regularly been blamed for not providing that support, Schefer said that this is not fair. "Maybe [management] doesn't understand fully, but more and more, [it has] come to recognize the inherent potential in, and the necessity for, effective information systems."

"In the 1980s, there will be a much greater emphasis by management on strategic planning," ac-

cording to Schefer, who is vice-president of information services at General Foods Corp.

A number of factors, among them regulatory action by government, scarcities of manpower and materials and other complex pressures, will make it necessary for management to use strategic planning in order to maintain those "difficult-to-maintain" profits, the keynote speaker said.

Schefer will embellish the speech with descriptions of his experiences developing an information system at General Foods over the past two years.

Six start-up sessions will follow Schefer's address, with five more speakers leading the fourteen conferences-within-a-conference, many of which begin their sessions on Monday. Schefer's keynote will also serve as the start-up session talk for the five-session information management conference.

What is the state of the art in marketing information systems? Neil Doppelt will review it and

note how it has been influenced by the "mature technology" and the improving price/performance ratios of the latest hardware.

Doppelt, a partner in Administrative Services at Arthur Andersen and Co., said in a recent interview he hopes the session he addresses on trends in the design and application of marketing information systems will help open up what has traditionally been an insular development by marketing companies.

Marketing managers generally do not have trade associations or other information resources on which to base systems planning and development. This is so largely because managers are reluctant to reveal the advantages of their systems to competitors, Doppelt indicated.

The address may help users to "understand what is do-able" and get better ideas of what the most successful companies have done with their "top tier" systems, as Doppelt describes them.

(Continued on Info/4)

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Words of Wisdom to Cover Areas Ranging . . .

(Continued from Info/1)

"There are only about four successful manufacturing information systems," according to Arthur S. Liss, another partner at Arthur Andersen and Co. and a speaker at Info this year.

Liss will examine the characteristics of these successful systems and discuss how such a system can be installed for the best results. The speaker indicated he would explore these characteristics with a speech called "A Road Map Through the Basic Choices."

The "road map" may help users "save a substantial number of wrong moves during the process of putting the system in," he said. In addition, the user "will at least be aware of what the other choices are — which is about

half the fight."

One wrong move that many manufacturing systems purchasers make is

to write their own software. It is usually wiser to buy a package, he recommended. Some packages "have half a

million lines of code. To reproduce that yourself can be very difficult, if

(Continued on Info/5)



Neil Doppelt



Arthur S. Liss

Info 79 Targets User Products

(Continued from Info/1)

will hear about policies for information systems planning.

Six speakers are scheduled to address related groups of conferences at Info 79 on Monday, Oct. 15. Each speaker will include a "Scenario for 1980" Information Systems," giving attendees an idea of what to expect in the future in the areas defined by each conference. Clapp and Pollak indicated.

Keynote topics include "Information Systems for the 1980s," "1980 Word Processing Systems," "Impact of Information Systems On Financial Management of the 1980s," "Design and Application of Marketing Information Systems," "Fundamentals of the Manufacturing Information System for the Information Systems Executive" and "What the Small Business Executive Should Know About Small Business Systems."

From the initial sessions, attendees can determine which of the succeeding speakers within each session best suits their specific interests, according to the spokesman, who added, "The purpose is to let you choose who you want, not to give you one theme and say, 'Here it is; this is good for everybody.'"

Speakers for the conference will be drawn from such companies and organizations as General Foods Corp., IBM, General Dynamics Corp., Texas Instruments, Inc., Standard Oil of California, Mobil, Allstate, Chase Manhattan Bank, MIT, the National Bureau of Standards and others.

The spokesman stressed that Info 79 was designed to help information managers answer such questions as "What information do you really want? What do you do with the information after you get it? and How are communications handled?"

The exposition and conference will encourage interaction between DP specialists and management. "We started off as a bridge between the technician and the user of information. The show [is] still just that, and the technician now is finding a very important place for himself; he constitutes one-half of the information-processing audience," the spokesman stated.

The diversity of its audience is one of the reasons Info 79 continues to run its conferences within a conference.

"What may be terribly important for someone in word processing may not be for another," he observed.

What executives and others who attend the conference are able to take back to apply to their businesses and organizations? Greater productivity in the office, according to the spokesman, who calls it the general theme of the conference.

"In the office, whether it is a salesman trying to get orders through quickly or whether it is a question of getting a bill out on time — all these things can take a long time or a short time." The conference could help them get things done in a shorter time, he said.

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... From Marketing, Manufacturing to WP

(Continued from Info/4)
not impossible," he cautioned.
How can word processing be used as an entrance into office automation and the office of the future? One of the speakers at the kick-off session on word processing systems of the 1980s will explore these and other questions at Info.

Moving Upward

On Monday, Oct. 15, Amy D. Wohl, executive director of the Office Systems group at Datapro Research Corp., will look at some of the issues involved when moving from word processing to increasingly sophisticated levels of office automation.

In her overview, she told *Computersworld* recently, she will touch on shared resource systems, the integration of data processing and word processing and the use of workstation terminals for management-level control.

Wohl will also look at function trends. "Systems now include some kind of numeric processing. That upgrade [from straight word processing] as well as modularity have become key



Reginald L. Jones

Elkins Park, Pa., suggested in a recent interview that the potential buyer make certain that an alternative to



Darrell Bortoff

computerization won't do before automating an office.

"Look carefully, analytically, to see if

you really have to computerize or if an alternative method can be arrived at," he said.

If computerization is feasible, the user must also decide whether to lease or buy equipment or make use of a service company.

Successful Automation

Bortoff said he plans to "discuss what must go into a successful automation effort and what questions must be answered by an analyst in developing a system requirement."

His talk will cover some of the common government applications to which a small business system can be put and will explain how his own township moved from a fully manual system to an automated one.



Amy D. Wohl

issues, as has whether or not a system is programmable," she stated.

Better Financial Planning

Data base technology and distributed data processing will give financial management the opportunity for better planning, according to Reginald L. Jones, a partner in charge of administration at Arthur Andersen and Co.

Jones said in a recent interview that financial executives will concentrate more on strategy and planning than they did during the last decade. "That implies that financial people will want more direct access to historical data, budget data and dimensional plans," he added.

Jones said he has seen an increasing emphasis on the use of APL in accessing data bases. Further, corporate managers are doing projections on division budgets and "getting more closely involved with the financial consequences of operating assumptions."

In the future, Jones concluded, we'll probably see opportunities for getting profitability and asset management information "more frequently than monthly."

Automating Small Businesses

"The most important thing is caution when approaching computerization." This caution will be the focus of a speech, given by Darrell Bortoff, an automating small businesses.

Bortoff, the director of fiscal affairs for the township of Cheltenham in

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Users Urged to Share Marketing Experiences

NEW YORK — Marketing is a competitive part of business, and the chairman of a session at the Marketing Systems conference here at Info 79 thinks users of marketing information systems would benefit from sharing some of their experiences.

While trade associations put out publications and meet to discuss and resolve problems in such fields as manufacturing or finance, marketing groups find it difficult to discuss their individual systems because much of the information they contain is proprietary.

The unwillingness to share experiences gained from working with marketing information systems has caused, in part, a lack of standardization of those systems, according to Neil Doppelt, a partner in administra-

tive services of Arthur Andersen and Co. in Chicago. Doppelt will head a session on the "Design and Applica-

tions of Marketing Information Systems" on Monday from 9 a.m. to noon. "I'm hoping that we can get people to

share a few experiences that will not abridge what they might consider to be a competitive edge," Doppelt said.

The "top tier" of marketing companies has a competitive edge over the rest of the crowd with their systems and "has successfully resolved many of the issues of marketing system development," he explained. Two speakers at the session represent those types of companies.

Donald Fleming, manager of scientific analysis at Standard Oil of Ohio, will speak on "Marketing Information System Support to Tactical and Strategic Planning." Patricia J. Gragert, manager of management science and information sciences at Nabisco, Inc., will discuss modeling in the analysis and development of marketing strategy.

"There are very few forums in which issues involving marketing decisions are discussed," Doppelt noted. "Many companies with good marketing systems have an edge over their competitors, and these systems have not been as well understood, perhaps, as financial and manufacturing systems. There is still a long way for many others to go."

Doppelt identified two levels of companies that have some work to do before they have developed the best systems, and he hopes to attract interested executives from both of them so they become more aware of what an advanced system can accomplish.

The "second tier" includes those companies that have the basic components of a marketing system in place, but have not made full use of it. The "third tier" includes those groups that produce statistical reports "without a great deal of management content," he explained.

In the second session in the marketing systems conference, a panel will cover the information needs of marketing management. It will be chaired by Malcolm Pennington of the Marketing and Planning Co. in New York.

The session is billed as a way for marketing managers to get the insight they need to plan a marketing information system. Four panelists are scheduled to speak on the various aspects of determining the needs of information marketing management.

Robert H. Donaldson, president of Mercury Printing, Inc., will discuss information needs for the market planner. Henry Sentf, head of Henry Sentf Associates, Inc., will cover information needs for market research; and Keith Mulcrone, president of High Technology Marketing, Inc., will review information needs for the marketing director.

The president of Find/SVP, a division of Information Clearinghouse, Inc., will talk on sources of marketing information, according to Info 79 sponsors.



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"Maybe It Wasn't Such a Good Idea to Give Him Full Authority."

Info 75

Photos by CW Staff Members

Info 75 kicked off on Sept. 8, 1975 in New York City. The exhibition hall — although smaller than in past years — drew record crowds. Minicomputers were just beginning to spark discussion, both on the exhibit floor and in the speaker sessions.



Burroughs Corp. demonstrated its B1724, the largest mainframe it showed anywhere in a long, long time.



It was a double take as Southern Systems, Inc. brought in an IBM 360/30 from Time Brokers to demonstrate its new I/O subsystem right next to the small IBM booth.



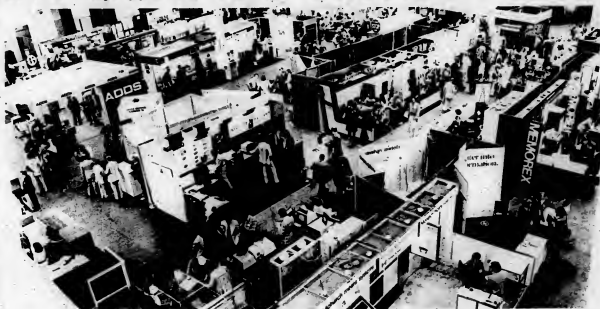
Keydata Corp. celebrated its 10th anniversary.



Oldtimers remember when Sonny M. walked up and down the boardwalk with sandwich boards advertising his equipment. This was his first show — inside.



Honeywell, Inc. decided to exhibit three weeks before the show and managed to sell its page printer right off the floor.



Part of the Exhibit Floor



"Cummins and See Us Some Time"

Info 76

Photos by CW Staff Members

Attendees at Info 76 in Chicago heard more than 200 speakers at more than 80 technical sessions. The show floor held over 137 companies, and crowd attendance was estimated at 11,300. Data terminal innovations and enhancements seemed to be the hot topic that year.



Under the Datapoint Arches



Info 76 attendees watch demonstration of IBM Word Processor/32.



Attendees try out throwing arms at Atlantic Software booth.



Nixdorf's Ray Stinson demonstrates the Model 6870 teletypewriter for Don Rubovitz and L. Patrick McClure.

Info 77

DPer met in the Big Apple to see and be seen at Info 77. Attendees had to put up with long lines, the noise of hawkers and the bright lights of exhibits — and that was all before they got into the show.



Info attendees gathered to watch demonstration.



Attendees reached out for hands-on experience.



This suitcase system was the topic of discussion.

Non-DPer Programming Seen DP Dollar Stretcher

By Tom Henkel
CW Staff

NEW YORK — With the cost of DP professionals skyrocketing and the cost of computer memory plummeting, one of the big challenges facing managers in the '80s will be to get their DP dollar's worth out of programmers.

One way of doing that is to let non-DPer pick up the lower end of a company's programming needs, according to Harold Feinlieb, vice-president for systems development at National CSS, Inc. Feinlieb is scheduled to speak on "Improving Productivity in Implementing Information Systems" at Info 79 here Oct. 15-18.

Most company programs fall into two classes: those used to support a companywide computer system and those developed for specific applications within the company. The latter group, Feinlieb said, should be developed by the employees who will use the particular application. This method will produce better applications and give official company programmers more time to work on larger jobs.

'Friendly Systems'

"Friendly systems," capable of electronic hand-holding for the non-DPer, will be the key to Feinlieb's plan. Easy-to-use languages that can link-in standard programming languages will allow managers to prepare and maintain their own programs.

"You can't afford to supply precious DP personnel to write [small applications] because the paycheck is not there. It might be addressing a small portion of the organization or one manager's personal needs," he said.

Nonprogrammer's programs "might decrease the machine's productivity, but it will take the burden off the DP professional. Everything seems to be moving in that direction. It's much more difficult to get good programmers, so you want to have them working on programs that are the most complex to implement," Feinlieb said.

Management must also be careful when implementing non-DPer produced programs, because they can potentially make a companywide system worse instead of better.

Consistency Important

Programming style, consistent enough to allow someone other than the programmer to understand what the program does, will also become more important when dealing with non-DPer. About 80% of most programs deal with straightforward commands. The other 20% presents the problem. "I'm not sure there's a solution," Feinlieb said.

Session 2.6 of "Improving Productivity in Implementing Information Systems" is scheduled for Oct. 17 from 2 p.m. to 5 p.m. in the New York Coliseum. Also appearing on the panel will be Kevin F. Tweedy, senior systems analyst for Standard Oil of California.



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Decentralization Viewed Isolating Information

By Tom Henkel
CW Staff

NEW YORK — If top management doesn't watch out, company information systems are going to get worse instead of better.

Decentralized processing systems, which are becoming more and more popular among large companies, can further isolate information — even if the intent is to make it more accessible, according to Arnold E.

Keller, associate publisher and editorial director of *Infosystems*. Keller is scheduled to chair three Info 79 conference sessions on planning information systems in the 1980s.

Keller will chair session 1.1, "Scenario for 1980 Information Systems"; session 1.2, "Information Systems Planning"; and session 1.3, "Information Systems Planning for the 1980 Corporate Environment."

Companies planning new systems and companies thinking of revamping existing ones should start with the basics. A start-from-scratch approach to determining what information a company needs is the only way management can avoid buying unnecessary hardware, Keller said in an interview recently.

"Most people are unhappy with their computer systems. This can be traced to management's failure to look upon the computer and related devices as anything more than a technical operation that rests with the DP manager. (Management has) never really gotten involved," he added.

"We've bungled [management information systems (MIS)]. Most MIS programs were under technical people who were more worried about the equipment than whether it was going to solve management's problems. MIS has become a batch-oriented system. We've got to go on-line," Keller said.

"The head of every department should sit down with the top people and decide what information the company really needs to operate the business," he stated. Managers can then decide what hardware is necessary to implement those needs.

Keller blamed DP managers, for keeping their managers in the dark about what was going on in the computer room. DP managers "get wrapped up in technology and try and talk in terms that indicate their expertise. They've got to start thinking about a generalist approach."

"Management is very concerned about dollars. Computers are getting to be the biggest budget item in many companies. In no other area of the company [would management] invest [in projects] without talking about dollars, and somebody would have to justify it. I don't know why that isn't a criterion when we're talking about computers," he said.

Many DP managers favor a decentralized approach to computing because individual departments aren't satisfied with the service of a centralized system. Keller, however, warned managers to be wary of decentralization because it could make information harder to access.

Both sides now

NorthStar[★]



In keeping with the fact that few new products were shown on the floor, Management Science America, Inc. featured its standby card tricks — but the crowd still loved them.



Diane Ries demonstrated IBM's recently introduced 8100, which drew large crowds.

Info 78

Photos by CW Staff Members

Robots and microcomputers made their presence felt at Info 78, held in Chicago. Few new products were displays at the show; IBM's booth featuring the 8100 was the big draw of the exhibit.



Cummins-Allison Corp.'s Orion and Future Systems, Inc.'s ZZ-U2 communicate with their "cousins," a Cummins-Allison Series 6400 and a Data General Corp. Dasher.



Ken Upcraft asked Jerry Wilson about the Computone Systems, Inc. VIP Model 600 system.



Would you believe it walks, talks and cries for its data?



Wang at Work



Strategic Planning Seen Vital in Insurance Work

By Jay Woodruff
CW Staff

NEW YORK — Strategic planning and the human factor are often left by the wayside when planners put together an information system for an insurance company.

Looking ahead at least three to five years and paying attention to the human element can be critical to the success of the system, according to

Gerald S. Maskovsky, chairman of one of the three sessions making up the Insurance Systems conference at Info 79.

Maskovsky, director at the Office of the Future at Cooper & Lybrand, Inc., will lead off the Wednesday session from 2 p.m. to 5 p.m. He will speak on the major elements of strategic plans for integrated information systems, then introduce three panelists who will address the themes touched on in his speech.

"The presentation will deal with the requirements and advantages of strategic planning, characteristics to consider in the planning process, deployment and use of technology and the human element," Maskovsky said.

The human element is not considered a significant factor in most system plans, although it deserves as much attention as the technology being used, he stated. "As we design and plan systems, we have to consider this element. Good systems often fail because we don't," he said.

Strategic planning is frequently ignored, he continued. "Anything shorter than three to five years is getting into tactical planning rather than strategic planning."

Information systems are important to an insurance company's profits, the chairman said. "Though an insurance company does not manufacture widgets, it is a paper factory. With better information, starting at the actuarial department all the way through the system, we can have better information and better profitability."

Two Other Sessions

The two other sessions of the conference — "An Integrated Insurance Company Network for the 1980s" and "Office Automation in the Insurance Company" — will be held Wednesday from 2 p.m. to 5 p.m. and Thursday, 9 a.m. to 12 noon, respectively.

Chaired by John J. Donovan, telecommunications director at Aetna Life and Casualty Co., the first of the sessions will cover the progress insurance companies have had in implementing satellite communications in their operations.

The session will include two panelists from Aetna — James Bradley, talking about the group division of the company, and John Perla, who will discuss the casualty division.

The session on office automation will focus on getting better price/performance ratios for equipment, possible candidates for automation and the results of previous automation attempts, according to session organizers.

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Top Jobs Seen Going to Managers, Not DPs

By Tom Henkel

CW Staff

NEW YORK — The DP purist is losing out to the DP novice. Many companies are hiring good managers over good DPs to fill the top DP manager's post.

The reason, according to William R. Synott, senior vice-president for the First National Bank of Boston, is that DPs are more concerned with the technical aspects of their jobs and simply can not relate to the top brass. Furthermore, DP purists have trouble motivating subordinates to do a good job.

Synott, scheduled to chair "Strategic Planning for Information Management in Banking in the 1980s" at Info 79, said if DPs do not wake up to the managerial world, they will wake up in an unemployment line.

Taking the stance that any good manager can quickly learn the DP

Wednesday, Oct. 17 at the New York Coliseum.

Also scheduled to appear are Richard N. Speer, senior vice-president for

Payment Systems, Inc. of Atlanta, Ga., who will discuss "Electronic Banking of the '80s"; and Linn Ego, vice-president of international operations

and technical services for Chase Manhattan Bank N.A., whose topic will be "Managing Information: Distributed Information Resources in the '80s."

Info to Stay in Big Apple

NEW YORK — The Information Management Exposition and Conference (Info) is in the Big Apple to stay.

Clapp & Poliak, Inc., which manages the Info shows, has changed its policy of alternating the show between New York and Chicago. Instead, the firm is starting a new show, called Info Manufacturing, which will be based in Chicago per-

manently.

"Info will cover all [DP] markets, while Info Manufacturing is directed at manufacturing executives," the firm explained. Clapp & Poliak got the idea for a separate show after it noticed that many manufacturing executives attend the Chicago shows but not the ones in New York, a spokesman said. The first Info Manufacturing

show is slated for November 1980.

Reflecting on problems show officials are having this year of competing with the National Computer Conference, which held its show in New York five months earlier, the spokesman said Clapp & Poliak isn't worried. Since NCC is in New York every third year, the two shows won't be competing with each other that often, he observed.



ropes, Synott commented, "Management is interested in getting people who can apply technology to business solutions. When they don't find this happening, their inclination is to put someone in there who doesn't even understand DP, but understands business."

Ruining Own Chances

DP managers are also ruining their own chances for survival by ignoring the business world around them. "The information manager has the opportunity to [learn business techniques] because the computer is so pervasive — it's all over the corporation."

"You have to learn a great deal about the business to develop systems to operate in those environments. [The DP manager] has a golden opportunity [to learn business management techniques] in his own organization. All he needs is the proper attitude," Synott said.

Information centers that have a sound technical foundation are the most likely candidates for a more business-like DP manager. "If you brought a businessman into an organization that was very bad to begin with, you'd have a hell of a time." In those situations, dual leadership divided between a DP technician and a good manager can prove a strong combination, Synott said.

Synott's session starts at 9 a.m. on



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Future Multiple-Mini Nets Seen Doing Work of CPUs

By Jay Woodruff

CW Staff

NEW YORK—Multiple mini-computers arrayed in a network as mainframes may help users of the future untangle two incompatible jobs that computers do these days: batch processing and interactive processing.

This is the observation of Dr. Jared A. Anderson, president of Two Pi Corp., the Santa Clara-

based IBM-compatible software supplier. Jared will address the first session of "Advances in Information Technology," one of the conferences-within-a-conference at Info 79.

The use of multiple minicomputers is now an affordable reality because of IBM's February release of network software for "very reasonable prices," according to Anderson.

The software allows a user to develop a network similar to an IBM internal computer network known as the Sun system. "You don't have to go out and write a lot of programs," he said.

The readily available technology "has a lot to do" with the IBM internal system, which comprises more than 200 computers "all talking to each other," Anderson said in a recent interview.

The availability of IBM 370-compatible minicomputers and the software to assemble them into a network makes it easier to "go out, buy the parts and hook it up," Anderson said. "I think there is a very good chance that we'll see quite a lot of it."

The first scheduled speaker at the "Advances" conference, Anderson said a network of minicomputers could offer a "tremendous" increase in computing efficiency. By off-loading interactive processing to the small processor, a large "cruncher" can be reserved for large batch jobs.

Although network computing could be done in a number of cities, Anderson's interest is to ultimately "put all those computers together in the same room, maybe in the same box, having them function as independent computers."

"The user need have very limited knowledge that he is talking to a network computer system" as opposed to a unit processor," he concluded. Anderson will be introduced by session chairman John L. Kitzky, editor of *Datamation* magazine.

Twelve Sessions

The "Advances in Information Technology" conference will be given in 12 sessions, with subjects ranging from interactive graphics, mass storage systems trends and DP security for computers and communications to "Image Processing for the 1980s," "Data Base Processors" and "New Approaches for Data Base Long-Range Planning."

A Tuesday, Oct. 16 session from 9 a.m. to 12 noon will cover the matured technology for secure computer and data communications and will be chaired by Peter S. Tasker, group leader at the Mitre Corp.

The session will feature talks (Continued on Info/18)

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Albert W. Paul
Data Processing Manager
Minolta Corporation
Rumney, New Jersey



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Tackling Risks Advised in Finance Planning

By a CW Staff Writer

NEW YORK — In an era when the dollar loses its value faster than a crash diet, can the value of capital expenditures be filled with risk.

Some ways that risk can be reduced will be explained in the Financial Systems conference session on "Information Systems for the Planning and Control of Capital Expenditure" here at Info 79.

Roy W. Rogers, manager of financial planning and analysis at SKW, Inc., will chair the session and show money managers some ways they can evaluate costs as well as the risks involved in the best and worst cases they can expect to experience.

"I want those attending to walk away with at least one method of analyzing the uncertainty involved with a capital expenditure. Though they may not get the exact numbers, they will understand the uncertainty, its limits and have some type of method to measure it," he said in an interview recently.

Those attending will be exposed to methods that will allow them to pinpoint the sensitive areas in budgets that are most likely to be affected by incremental spending increases. Knowing that, the system user will be better able to project a return on investment, Rogers said.

System planning has changed in its emphasis since the advent of greatly increased inflation. Since the uncertainty of actual cost is greater than it was 10 years ago, planners are making greater efforts to reduce the greater risk, he continued.

Rogers will be joined by G. Wagle, corporate controller for Guterl Special Steel Corp., and he is scheduled to discuss how cash flow from operations can be used to make investments. His presentation will explore how the investment program fits within the total planning effort, "so you know you've invested enough money to continue your cash flow," Rogers said.

In addition, a third speaker will review methods of figuring actual cost vs. expected cost. The systems presented here will enable the user to see a cost overrun before it happens and show techniques for gauging progress such as measuring milestones, Rogers

said. Unfortunately, the name of the speaker was not at hand when the interview was conducted.

Reginald L. Jones will give an overview on the impact of information systems on financial management in the 1980s. In another session, the use of computers to model strategic and long-range planning for financial management will be covered in a session chaired by Prabhuling Patel, assistant vice-president of Citibank N.A.'s Thrift Division.

Speakers at that session include Richard A. Runco, vice-president at Citibank speaking on planning and modeling for tax management, and Ashok Luthra, business administrator at American Can Co., speaking on application of cost and planning models

to long-range planning.

Other sessions will cover long-range systems planning in the finance orga-

nization, selected topics in financial information systems and budgeting and operational planning systems.



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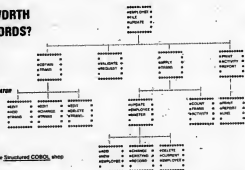
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By a CW Staff Writer
NEW YORK — When raw materials were plentiful and easy to get, batch processing kept the manufacturing process running smoothly.

These days, supplying a manufacturing operation has become a tall order, especially in light of the scarcity of materials and the need to order them far in advance.

These observations by Virgil L. Myers, director of the Diebold Group, form the background of his message that the shift from demand management — ordering supplies as they are needed — to supply management — ordering them as they are available and storing them until they are needed — should be paralleled by a shift from batch processing to on-line computer processing.

Myers will chair a session on "Architecture of Manufacturing Systems in the 1980s," part of the Manufacturing Systems conference to be held at Info 79, starting Tuesday, Oct. 16 at 2 p.m.

Because it is difficult to have resources ready when they are needed — and the difficulty is "several orders of magnitude worse than it was a decade ago," Myers said — factories now need as many terminals as airlines and insurance companies do to keep up with the demand for better manufacturing strategies.

"Manufacturing systems do more than control inventories and purchase orders," Myers pointed out. "They determine how human resources and capital equipment can be effectively and efficiently applied."

A number of other factors point to the need for on-line interactive systems in manufacturing, he continued. Building products to order instead of to stock specifications, shortening product cycle manufacturing, and tracking materials down to the level of single parts have

greatly increased the complexities information managers must work with.

Microcomputers on shop floors will be as common as "safety glasses" in order to keep up the efficiency of the production process, Myers suggested. Life on the shop floor might be less boring with an electronic partner to work alongside, he added.

Session panelists will give listeners reports on minicomputer-based manufacturing systems, distributed manufacturing systems and integrated process management and control.

Arthur S. Liss (see article on Info 79 speakers) will stress the importance of transaction accuracy in the manufacturing process. "To get transaction accuracy, you need detailed feedback from the shop floor. The lack of training and followup to get that to work can make many systems fail and usually does," he said.

The cost of data base accuracy can exceed the cost of the rest of the manufacturing information system project. In addition, most data bases are inaccurate and do not represent how things really happen in the process, he said.

The bill of materials data base and the routing data base representing the manufacturing process are both massive, as are their costs. It is therefore critical that people be trained in their use. "Everybody, from the president to the shop foreman, is going to have to get some fairly practical training in both the philosophy and operation of the system," Liss stated.

Liss, a partner at Arthur Andersen and Co., will chair a session on "Basic Alternatives for Manufacturing Information Systems." Panelists at the session will discuss hardware/software alternatives and data base, training and project organization.

Minis To Act as CPU?

(Continued from Info/16)
on the Department of Defense program to stimulate the incorporation of "high-integrity access controls in emerging computer manufacturers' product," the use of encryption in widely dispersed networks and a review of the application of "public key systems" to key distribution in a computer network using the data encryption standard for data protection.

Frank R. Kline Jr., marketing manager for International Data Corp. (IDC), will chair a session made up of IDC executives for a "Status Report on

Communications Networks." Kline will present an overview while John Gantz, director of publications, discusses "Networks for Tomorrow."

User Expectations

Nancy C. Scull, senior consultant, will review user expectations and attitudes toward the available communications services. Roger H. Allen, director of the West Coast Editorial Bureau, will offer a view of the federal government's role in communications and its impact on the user. The session will be held Wednesday from 9 a.m. to noon.

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COMPUTER QUIZ

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IESI The data entry people.

NEW YORK — What could be more fun in New York than trying good restaurants — and not getting stuck?

Connie Winkler, Computerworld's New York correspondent, has sampled many along with clipping the best bets from New York food critics and suggests the following list.

Taste Treats Near Coliseum

Cafe des Artistes, 1 W. 67 St., 877-3500. New York Times restaurant critic Mimi Sheraton's favorite for "Old World artfulness of its setting" with only decent food. Where she takes out-of-town visitors.

Tavern-on-the-Green, Central Park West and 67 St., 873-3200. Pleasant surroundings in the midst of Central Park — owned by the same restaurateur who owns the more famous Maxwell's Plum on the East Side.

Museum Cafe, 366 Columbus Ave. at 81 St., 724-7509. Sidewalk cafe popular for Sunday brunches. Behind Museum of Natural History. Near up-and-coming shops on Columbus Ave.

Nirvana, 30 Central Park South, 752-0270. Wonderful view of Central Park, but go for the food, too. No matter where you sit, mirrors give you constant park view. Phonebook touts it as "Nirvana on Rooftop, Bangladesh, India, Pakistan International Gourmet Restaurant." Complete dinner \$10 to \$15. No credit cards.

Gaylord's Indian Restaurant, 58 East 58 St. between Madison and Park, 799-1710. Based in London with restaurants in San Francisco, Tokyo and Hong Kong. Specializes in Tandoori chicken. Open from 11:30 a.m. until 11 p.m. A favorite of CW Managing Editor Nancy French. Get your fortune told for \$5.

Alfredo's Restaurant, 240 Central Park South, 246-7050. Famous Italian. Expensive, but good.

The Ginger Man, 51 W. 64 St., 399-2358. Nice, nearby, but expensive. Pre-Prohibition decor. After-theater menu.

Rikyū, 210 Columbus Ave. near W. First St., 799-7847. Pleasant and reasonable Japanese restaurant. It's safe to eat the sushi and sashimi (raw fish).

Top of the Park, One Gulf & Western Plaza, Central Park West at 60 St., 333-3800. Romantic restaurant 43 floors above New York overlooking Central Park, New York, Hudson River and New Jersey. International menu at moderate prices according to guide book. Reservations required.

Best Morsels Uptown

Adam's Rib, 23 E. 74 St. between Madison and Fifth Ave., 535-2112. American cuisine in subdued English dining room.

At One Place, 2527 Broadway at 94th St. Middle Eastern and vegetarian specialties served in multileveled, mir-

rored room. Friendly and informal. Cafe San Martin, 1458 First Ave. at 76th St., 286-0470. Continental cuisine in imaginatively stylish restaurant with skylights.

Chateau Henri IV, 37 E. 64 St. between Madison and Park Aves., 757-6616. Fine continental and French cuisine in romantic, castle-like room. After-theater menu.

Daly's Dandelion, 200 E. 61 St., 838-0780. Former speakeasy, now with American food and old New York charm.

Friday's, 1152 First Ave., corner 63 St., 832-8512. Where singles still gather for food and spirits. After-theater menu.

Il Vagabondo, 351 E. 62 St., 832-9221. Fun restaurant with good food alongside a boozey crowd. Menu recited by waiters.

Kleine Konditorei, 234 E. 86 St. between Second and Third Aves., 737-7130. Famous German restaurant in the heart of old German neighborhood.

La Cocotte, 147 E. 60 St. between Lexington and Third Aves., 832-8972. French cuisine in elegant dining room.

La Folie, 21 E. 61 St., 765-1400. "The restaurant is like a jewel box, every inch precious," according to one reviewer. French cuisine.

La Petite Ferme, 973 Lexington Ave. between 70 and 71 Sts., 362-3272. French farmhouse with outdoor garden for drinks and French food.

Le Comp de Fusil, 160 E. 64 St., 751-9110. Featuring "la nouvelle cuisine," a light French food with emphasis on the quality of each ingredient, beauty and taste of each dish. Limited menu varies monthly.

Yummy Uptown, Chinese Style

New York Magazine's restaurant critic Gale Greene earlier this year scoured the city and found favorite Chinese restaurants almost every place but in Chinatown.

Shun Lee Palace, 155 E. 55 St., 371-8844. If there were to be only one Chinese restaurant in town, I'd do voodoo to make sure it was Shun Lee Palace, "Greene said. Best Peking duck in town at \$21; she raves.

Fortune Garden, 1110 Third Ave. near 67th St., 744-1212. New place on fashionable East Side. Greene's second choice.

HSE, 578 Second Ave. near 32 St., 699-6969. A spin-off of famous Hse, Seung Fung on the Bowery in Chinatown. "HSE soars with its dim sum," small dumplings filled with meats and vegetables; great for lunch.

Pearl's, 38 W. 48 St., 586-1000. The place that brought Cantonese food uptown. Best eggs with hot sauce in town.

Uncle Tai's Hunan Yuan, 1059 Third Ave. near 62 St., 838-0850. "Soothingly consistent, even at lunch," says Greene.

Hunan, 845 Second Ave. at 45 St., 687-7471. Home of the hot sauce Olympics.

in New York

Chinese In Chinatown

Tung Sing, 6 E. Broadway, 966-0810. Chinese menu is on the wall. Ask for translation. Best salty fried squid.

Hee Seung Fung, 46 Bowery, 374-1319. "When it is good, Hee Seung Fung is very, very good, but at times it drops through to a trickle, and once in a while the kitchen can be erratic," reports Greene. Best dim sum. Canton, 45 Division St., 226-9173. Favorite of architect I.M. Pei. Kitchen is eager to please. Best duck liver and pork sausage with steamed Chinese broccoli.

Hop Shing, 9 Chatham Sq., 267-0220. No credit cards. Good place to try unusual chicken, clams, beef and oysters. Hooker Corporation, 54 E. Broadway, 226-0969. No credit cards. A "shabby storefront haven of Shanghai home cooking," often full of happy diners.

Good Choices On East Side

Akbar, 475 Park Ave. between 57 and 58 Sts., 838-1717. Serving special Indian Mughal cuisine. Reservations.

Amalfi, 16 E. 40 St., 758-5110. Italian cuisine. Established 1927. Warm, homelike atmosphere.

Antioch, 337 E. 49 St., 688-6767. Italian and continental cuisine. Established 26 years. Rated one of the finest Northern Italian restaurants.

The Azarati, 4 E. 36 St. between Madison and Fifth Aves., 686-4622. Excellent Armenian cuisine featuring Middle East specialties.

Autopub, 59 St. and Fifth Ave. in General Motors Building, 832-3332. Great fun to dine in a car. American steaks and chops.

Bacara, 203 E. 45 St. between Second and Third Aves., 682-4505. Elegant yet moderately priced Italian restaurant.

Bendham of Tokyo, 120 E. 56 St. between Park and Lexington Aves., 593-1627. Japanese decor and food prepared at your table by chefs trained in showmanship and flair.

Blueprint 100, 100 Park Ave. at 40 St., 684-4500. Sumptuous dining, modern elegance. Continental and Italian cuisine.

Brasserie, 100 E. 53 St., 751-4840. A pleasant, reasonably priced place open 24 hours a day, seven days a week. French ambience. They will also make a picnic basket if the spirit moves you.

The Brewery, 85 E. 43 St., 563-7440. Tiddled after interior of Ave. Prohibition brewery complete with mixing vats and brewer's pipelines. Help yourself to giant barrel of peanuts.

Bruce Ho's, 116 E. 57 St. between Park and Lexington Aves., 753-2610. Cantonese food well prepared and served in elegant surroundings.

Brussels, 115 E. 54 St. between Park and Lexington Aves., 758-0457. Haute French in Old World townhouse with exceptional wine cellar.

Cafe Argenteuil, 253 E. 52. at Second Ave., 753-9273. French cuisine in

French Provincial atmosphere.

Cafe Europe, 347 E. 54 St. between first and second Aves., 758-0160. Continental cuisine, French Provincial decor. After-theater menu.

The Cattleman, 3 E. 45 St., 661-1200. Adult Western restaurant with steaks, prime ribs and fine food in elegant old San Francisco setting.

Charlie Brown's, Pan Am Building, 45th St. between Vanderbilt and Lexington Aves., 661-2520. Best thing is the location adjacent to Grand Central Station. Nice meeting place; nibbles at cocktail hour.

Christie, 143 E. 49 St. between Third and Lexington Aves. Italian cuisine in

old-fashioned paneled decor. After theater menu.

Clos Normand, 42 E. 52 St. between Park and Madison Aves. French cuisine in beautiful Normandy decor.

Club Ible, 151 E. 30 St., 753-3884. Gourmet's dream come true in stun-

ning reproduction of a Nile palace during Cleopatra's reign.

The Cotton Patch, 1066 Second Ave. at 56 St., 688-6595. New York's leading Southern-owned and operated restaurant in cozy 100-year-old bar with special hickory-smoked pit barbecue.



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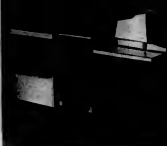
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PCC's

Part I Concurrency

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It's called concurrency—the uncanny ability to do many complex tasks at the same time. The complexity of human life demands it.

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And so, in designing the PCC XL40 and XL20 DDP systems, we imitated the human brain. Four functions, each operating concurrently. Each transparent to all terminals but those that wish that function.

Data Entry:

It's turnkey—with enormous flexibility. Operate up to 16 terminals concurrently with 16 station printers. The XL40 can operate these devices in various combinations either directly wired or via telephone lines. And you have a choice of 480- or 2000-character CRT displays.

File Inquiry:

While entering data, user departments, both local and remote, can concurrently enter/extract information. COSAM (COBOL Shared Access Method) gives you responsive, wide programming accessibility. You can immediately validate information while creating a real-time data base. It's a total interactive environment.

PCC SYSTEMS
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Peopleware

A new concept in DDP

Processing:

The essence of concurrency. Since the XL is COBOL-based, mix your data entry, data management and transaction processing. Operating system is XL/OS. So you get Resource Management, Data Management, File Processing, Program Compilation and Input/Output Operations—all at the same time.

Communications:

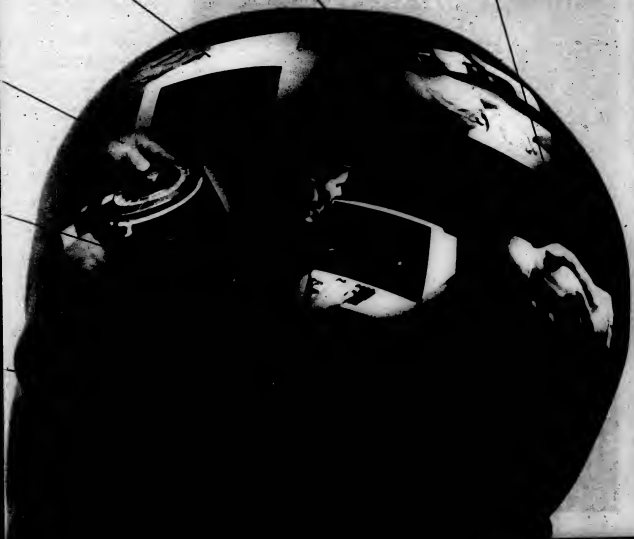
Available XL40 protocols include 3740/3741, 2780, 3780, 380/20 HASP and 377X (SDLC). Plus 3270 host interactivity. You can down-line-load to another XL40 or XL20 to create files, and either conversationally or in a batch mode provide required information to the host. Plus you can capture data, query files and generate reports.

Concurrency is just one example of how PCC has used its Peopleware concept in its XL40 and XL20 systems. We'll discuss more ways in future essays.

Peopleware—it makes our DDP systems more effective. And your DDP buying decision simpler.

XL40 and XL20 are products of Pertec Computer Corporation, an international company that designs, manufactures, and services computers and computer equipment.

For more information, call us toll-free at 800-331-1001. (In Oklahoma 918-664-9800.)



More New York Restaurants

(Continued from Info/21)

Copain, 891 First Ave. at 50 St., 758-0554. "French Connection" filmed here. Continental cuisine.

Copier Club, 200 Park Ave., Pan Am Building, 973-2100. Skyline dining with limited menu.

The Cowboy, 60 E. 49 St. between Madison and Park Aves., 697-2500. Chili, burgers and barbecue and 75-foot copper bar.

Crowing Cock, E. 46 St. in Hotel Roosevelt, 536-7440. Irish cooking and setting featuring "cozies" — little private nooks for parties of two, four or six.

Curds 'N' Whey Cafe, 4 E. 45 St., 682-8876. Health food cafeteria with

wood and greenery.

Delegates Dining Room at the United Nations, First Ave. at 46 St., 754-7625. Public admitted 11:30 a.m. No reservations. International cuisine. No credit cards.

Deszaley, 54 E. 58 St., 755-8546. Swiss cuisine.

El Parador Cafe, 325 E. 34 St. between First and Second Aves., 679-6812. Mexican dishes in romantic atmosphere.

Fonda La Paloma, 256 E. 49 St. between Second and Third Aves., 421-5495. Mexican cuisine in townhouse with strolling guitarist.

Four Seasons, 99 E. 52 St., 754-9494. The one and only. Menu and decor

change with seasons. Some say this is a must place for New York visitors.

Gevroche, 222 E. 58 St., 838-0279. Excellent authentic French cuisine, three stars by some critics.

Giambelli 50th, 46 E. 50 St. between Park and Madison Aves., 688-3760. Giambelli Madison, 238 Madison Ave. between 37 and 38 Sts., 685-8727 — the original. Authentic Northern Italian cuisine.

Gian Marino, 221 E. 58 St., 752-1696. More than 200 Italian dishes, including 65 pastas.

Gloucester House, 37 E. 50 St. between Park and Madison Aves., 755-7394. American seafood — fresh. Model ship display and scrubbed table

tops.

Gov-nor Steak House, 303 Madison Ave. between 41 and 42 Sts., 867-0540. Brick and wood-paneled background for charcoal steaks and lobster.

Horn & Hardart, 200 E. 42 St. at Third Ave., 972-1837. The last automaton.

Il Rigoletto, 232 E. 53 St., 759-9384. Italian cuisine in intimate European setting with operatic music.

Joyce's Steak & Seafood House, 948 Second Ave. at 50 St. A New York rarity, an enchanted place where good foods and wines are served with Irish friendliness.

Kamehachi, 14 E. 47 St., 765-4737. Japanese cuisine specializing in tempura and raw fish.

Kitty Hawk, 565 Third Ave. at 37 St., 661-7406. American food served along side aeronautical memorabilia and antiques.

La Rotisserie, 153 E. 52 St., 759-1685. Authentic French in beautiful decor.

Laurent, 111 E. 56 St. between Park and Lexington Aves., 753-2729. French cuisine in elegant, spacious surroundings and seasonal specialties.

Good Bets On West Side

Act I, One Times Square, 695-1680. American and Continental cuisine with panoramic view of Times Square.

Al and Dick's Steak and Seafood House, 151 W. 54 St., 757-0095. Soft, candle-lit atmosphere with the best waiters. Pre- and after-theater menu.

American Cafeteria, 630 Fifth Ave. at 50 St. in Rockefeller Center Concourse Promenade, lower level, 581-3580. Handsome cafeteria decorated with state maps. Pastries baked on premises.

Apertivo, 29 W. 56 St. between Fifth and Ave. of the Americas, 765-5155. Northern Italian cuisine which got three stars from one newspaper critic.

Arthur's, 44 W. 56 St., 581-9765. American and continental cuisine with showcase for new talent and singing waiters and waitresses. Pre- and after-theater menu.

Assembly Steak House, 16 W. 51 St. between Fifth and Ave. of the Americas, 581-3580. Attractive steak house acclaimed by critics.

Au Tanne, 306 W. 48 St. between Eighth and Ninth Aves., 582-2166. French cuisine in small, family-operated bistro.

Barbetta, 321 W. 46th St., between Eighth and Ninth Aves., 246-9171. Northern Italian cuisine in stunning 18th Century Piemontese decor with summer garden.

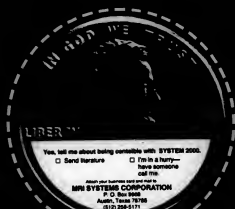
Broadway Joe Steak House, 315 W. 46th St., 246-6513. American cuisine with after-theater menu.

Cafa Coco, 555 Seventh Ave. and 39 St., 354-0210. Continental and French cuisines in French re-creation in heart of garment center.

Capriccio, 11 W. 56 St., between Fifth and Sixth Aves., 757-7795. Specializing in Northern Italian cuisine, especially proud of homemade pasta.

Carnegie, 854 Seventh Ave. at 55 St. One of the best delicatessens in town,

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The Changing Face Of DP Training

Part 1: The Status of DP Training

By Gary Slaughter
And Jack Stone

The need for company-sponsored DP training has long been recognized, particularly in the area of systems development.

Prior to 1970, training was generally supplied by the mainframe vendor at no charge. As a result, the training function was handled informally in practically all large DP organizations. Courses were selected by individuals based on personal appeal, with little consideration given to long-range training needs or plans.

Since that time, beginning with IBM's "unbundling" of its formerly "free" educational services, the DP training function has grown in importance and budget for many of the larger installations. In many cases, it is a formal part of the organization. The title "director of data processing train-

ing" is not uncommon now, nor are a full-time training group of a half dozen people and a \$100,000 annual training budget.

However, DP training budgets are almost always established by "seat-of-the-pants" guesswork. Rarely are the budgets justified beyond a relatively fixed percentage of the overall DP budget. Few DP trainers actually know how to justify DP training on an objective basis. And even in those rare cases where the training is objectively justified, it is seldom measured and evaluated in ways that validate the benefits of the training that is delivered.

The '60s will bring new demands for improved justification, measurement and evaluation of DP training as the competition for budget dollars intensifies. It is hoped that as DP training matures, this series will provide some assistance to DP organizations in performing these important training management functions.

This article, the first of a four-part

series, summarizes the status of the DP training industry as of the end of this decade. It is based on the fourth "Annual DP Training Survey" conducted and published in 1978 by Gary Slaughter, president of the Brandon Systems Institute. (The results of the 1979 survey will be available from the institute by the end of the year.)

The remaining three articles will deal, in sequence, with the reasons for justifying DP training, how to cost justify and how to measure and evaluate DP training effectiveness. The last article will also include a self-appraisal quiz to help the reader determine where his organization stands with respect to these methodologies.

Results of '78 Survey

This survey covered 98 large DP organizations. The typical DP organization surveyed was composed of about 272 people and operated on an annual budget of \$7,600,000. Following are selected questions, survey answers and interpretations:

1) What is your position or title?

(98 responses)	
DP training director	53
DP manager	14
Systems manager	2
Operations manager	8
Other	29

Questionnaires were to be completed by the individual who makes decisions or recommendations to acquire DP training for their organization. A slight majority of the respondents had given key decision makers the title of training director. But, in many other organizations, DP training decisions still remained with top DP management or its staff or support groups.

2) If you are a DP training director, is DP training your full-time job?

(61 of 53 training directors responded)	
Yes	30
No	21

Many DP training directors spend only part of their time on DP training. Their other duties include administrative functions.

(Continued on In Depth/2)

DP TRAINING IN DEPTH

In Depth/2

(Continued from In Depth/1)
tion, standards and, procedures and systems analysis. Six stated that they devote only a small part of their time to DP training.

3) How many people make up your entire DP organization?
(94 responses)

	AVERAGE
DP management	38
Applications systems analysis and design	49
Applications programming	67

Systems programming 20
Operations 108
TOTAL 272
The respondent organizations are quite large. Only six organizations with fewer than 50 people completed the questionnaire.

4) How many full-time people make up your DP training staff? How many of these people report to you?
(95 responses)

	AVERAGE (RANGE)
Full-time people on staff	2.8 (0 to 17)

Number of full-time people reporting 1.7 (0 to 17)

Even though 12 of the 51 respondents with a DP training director have at least five full-time people, full-time DP trainers are rather rare. In fact, 29 of the 98 respondents had no full-time people.

Based on an average population of 272 full-time people in the responding DP organizations, there is an average of only one full-time DP trainer for every 100 DP staff members.

5) What is your annual salary? (89 responses, including those of 50 training directors)

	AVERAGE (RANGE)
DP training	\$23,440
Directors	(\$11,400 to \$40,000)
All respondents	\$23,100 (\$11,600 to \$43,000)

Salaries for training directors are comparable with all others in a position of responsibility for DP training and are relatively high. This suggests that top management places a high value on training.

6) What is your annual (total) DP budget?
(71 responses)

	AVERAGE (RANGE)
Annual DP budget	\$7.6 (\$5.14 to \$335)

Respondents had, on the average, very sizable budgets. Only 10 reported budgets of less than \$1 million.

7) What is your annual DP training budget? Include staff salaries and overhead, but not attendee salaries.
(85 responses)

	AVERAGE (RANGE)
Annual DP training budget	\$113,400 (\$1,000 to \$600,000)

The average training budget is only 1.5% of the average total DP budget of \$7.6 million. But the budget has improved over the 1.2% reported in the 1977 survey.

8) How is your training budget distributed over personnel in the following disciplines?
(35 responses)

	AVERAGE
DP management	\$25,070
Applications systems analysis and design	\$3,290
Applications programming	\$6,410
Systems Programming	\$1,160
Operations	\$8,870
TOTAL	\$141,800

It should be noted that the total number differs from the number indicated in question 7. This is attributed to the different number of respondents answering the two questions.

These numbers take on particular importance when they are compared with the average number of people in each organizational group (question 3). Here are the results from calculating the average number of dollars spent annually per person in each of these same disciplines:

	AVERAGE
DP management	\$699
Applications systems analysis and design	472
Applications programming	683
Systems programming	890
Operations	267
Overall average per person	\$518

Average dollars spent for applications programming and DP management increased significantly over the previous year, while those for operations and systems analysis remained about the same. Recent emphasis on programmer productivity and structured programming techniques certainly contributed to the increase.

New interests in distributed processing, privacy and security and long-range planning probably accounted for the increased budgets for DP managers. As is traditional, operations per-

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DP TRAINING IN DEPTH

sonnel continue to receive the lowest training budget.

9) Do you have a centralized DP training function or does every group within DP do its own training?

(98 responses)	
Centralized	91
Decentralized	12
Both	5

In recent years, the trend has been to centralize the DP training function and designate a person to direct the DP training activities. This trend seems to reflect an improvement of management attitude toward the value of training and its role in improving organizational effectiveness and profitability as organizations mature and become more stable.

10) Is your DP training group a part of the DP department?

(95 responses)	
Yes	91
No	13

DP training has historically been a part of the DP organization for several reasons. First, the content is highly technical; subject matter specialists are required to select programs in an intelligent way. Second, the content is volatile and subject to frequent change. Third, the number of people to be trained is usually small compared with the numbers involved with more conventional training.

But as career development programs and job standards in DP stabilize, it is expected that training programs will do the same. During the process, the participation of the regular personnel and training departments will gradually but surely increase. DP training may ultimately migrate to the central training function.

11) How do you get your training budget?

(98 responses)	
a. Operate on revolving fund. Attendees are charged for courses.	8
b. Operate as overhead function as part of DP budget.	74
c. Operate as overhead function as part of central organization training budget (including non-DP training).	12
d. "b" and "c" combined.	3
e. Other.	3

About 88% of the DP training organizations are funded out of the overhead

budgets of either the central training group or the DP department.

This arrangement has caused instability in the past for some DP training groups. The problem is that, during economic slowdowns, training which is organized as an overhead function is susceptible to radical cutbacks.

On the other hand, DP training organizations operating on a revolving fund basis are usually more secure from these cutbacks, because they can justify their existence in a pragmatic,

bottom-line way. The revolving fund arrangement is more difficult to charter and organize, but is probably more effective once it is established.

12) What is the most serious problem you face in carrying out your training job?

(94 responses)	
a. Maintaining high-quality, up-to-date, and complete training programs.	35
b. Lack of support from management.	21
c. Setting aside time for training.	13
d. Lack of qualified training staff.	13

a. Budget constraints — high cost of training.

Problem categories a and d reflect a major concern about the quality of training that has been expressed by respondents to these surveys over the years. Problem categories b, c and e are indicative of the DP training group's long-standing strivings for expanded management attention and increased budgets. But management is becoming

(Continued on In Depth/4)

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DP TRAINING IN DEPTH

In Depth/4

(Continued from In Depth/3)
more aware of the importance of DP training and is relating the function to improved organizational effectiveness; this is evidenced by slow, but sure, increases in the training budget.

13) In what subject areas are you having difficulty finding qualified outside vendor training?

(62 responses)	
Operations training	9
Systems analysis and design	8
Data base design	5
Management	4
Data communications	3
Hardware	3
Language programming	3
Writing	3
Software packages and systems programming	3
Structured analysis, design and programming	2
User training	2
Other	7
None	30

Despite the widespread availability of training on almost any DP subject, many respondents are still concerned about finding training vendors who produce, in their judgment, quality courses.

The lack of effective operator training programs has been a long-time concern of DP trainers. Part of the problem, of course, is the configuration-dependent nature of the training. But there are also operational difficulties: too many operators "can't be spared to get trained."

Problems with obtaining quality systems analysis and design training stem in defining particular needs for improved skills and knowledge in his or her own organization and then finding matching programs.

14) Do you send people to vendor-supplied courses which are offered on a public basis? If not, why not?

(96 responses)	
Yes	88
No	10

Nearly all respondents said they use public courses. Those that don't gave budget constraints as the reason.

Training vendors have indicated in separate discussions that the costs of producing public courses have skyrocketed. Because of these costs and the business risks associated with public programs, a number of vendors have phased down their public offerings.

15) Do you use outside vendors to teach their courses on-site, at your offices? If not, why not?

(96 responses)	
Yes	77
No	21

More people use vendor-supplied public training (question 14) than use vendor on-site training.

Budgetary constraints, as related to the number of available attendees necessary to achieve economies, were the main reasons given for not using on-site services. Yet, it is not unusual for a vendor to train on-site 25 attendees at a cost of only 10 times the tuition per attendee at a public seminar, excluding travel and living expenses.

16) Do you train user department people?

(97 responses)	
Yes	70
No	27

Of the respondents who answered "yes," 62 listed subjects their user training covers. More than half of these respondents have introductory DP courses.

Other subject areas mentioned were: how to use applications systems, project management and systems analysis.

Many DP organizations that operate on a charge-back basis are taking advantage of the recent surge of user interest in DP training. They are using some of their proceeds to help finance expanded training programs for the DP staff.

17) When your organization cuts its budget, how does training fare?

(92 responses)	
Training goes first	14
Training goes second after	

another budget	1
Training is generally cut in proportion to rest of budget	36
Training budget is generally not cut -	21

Most organizations report that training budgets fare as well as other budgets when cutting season comes.

Although the percentage is down slightly from the results of last year's survey, more organizations report that training budgets are "generally not cut" than report that their budgets are the "first to go." This was not true five



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DP TRAINING IN DEPTH

years ago. This year's response, however, seems to suggest that DP training budgets, like the economy, are leveling off.

18) Where is your DP budget headed? (97 responses)

Anticipate growth 58
Anticipate a cut 6
Status quo 33
With few exceptions, respondents forecast growth or status quo in their future budgets.

However, the percentage of organizations seeing growth ahead is lower than that of last year, while the percentage seeing status quo is up. This change roughly parallels the leveling off of the economy.

19) How many days of training each year does your DP training group provide each individual in the major DP disciplines? (69 responses, provided in first column)

Training Days (Yearly Ave.)	Cost Per Training Day (\$145)
DP management	8
Applications systems analysis and design	11
Applications programming	14
Systems programming	9
Operations	9

The second column provides an estimate of the average cost per training day per person in each of the five disciplines listed. It was derived by dividing the average number of dollars

spent annually for training in the discipline (question 8) by the average number of training days reported above.

Not too surprisingly, the cost per training day of DP managers and systems programmers is the highest, and the cost for operators is the lowest, by far.

20) Part 1: Do you have a formal training program for systems analysts? (98 responses)

Yes 54
No 44
Part 2: If yes, how do you train the majority of your systems analysts? (54 responses)

Internally developed and presented courses	10
Audio-visual training	11
Outside vendor public training	6
Outside vendor in-house training	6
Combination of above	20
Other	3

There is a wide divergence in the approach to systems analysis training. Almost half of the respondents have no formal program at all.

About a third rely on audio-visual or vendor public training. Twenty organizations reported using a combination of the four methods, which suggests a balanced approach to the solution of this important training problem. Ten DP centers have chosen the most costly, but perhaps the most effective, method of developing and presenting the program with the in-house staff.

21) Part 1: Has your organization implemented structured design and programming? (95 responses)

Yes 63
No 34

(Continued on In Depth/6)



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DP TRAINING IN DEPTH

In Depth/6

(Continued from In Depth/5)
Part 2: If yes, how do you train the majority of your people in structured design and programming?

(61 responses)	
Internally developed and presented courses	26
Audio-visual training	9
Outside vendor public training	3
Outside vendor in-house training	10
Combination of above	21
Other	2
Most respondents have implemented	

structured design and programming and appear to be using a mixture of training approaches to meet their training needs in this area.

This observation suggests a maturing use of these productivity techniques, at least in the large data centers.

22) When making a decision between "making" or "buying" your own training programs, what is your primary consideration? Rank order from 1, most important, to 4, least impor-

tant.

(86 responses)

Weighted Ranking	
Number of students to be trained	3.02
Uniqueness of course	2.43
Reputation of vendor	2.71
Cost of vendor's training	1.79

Respondents indicated that the number of students to be trained is the primary consideration and cost is the least important when considering a "make" or "buy" decision.

Uniqueness of course and vendor's

reputation are related to continuing concerns about course quality.

By way of conclusion, the DP training function has grown in importance over the last decade because of management's desires for better internal controls on training expenditures and improved quality of training programs. Results over the decade have validated the wisdom in establishing training groups. Training plans have improved and the quality of training has increased.

This growth is also attributed to the expectation of DP management that training would help solve the problems associated with rapidly rising salaries, increased turnover and reduced productivity, matters which will be discussed in the second article in this four-part series.

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Gary Slaughter is president of Brandon Systems Institute, Inc., an independent DP training organization headquartered in Bethesda, Md.

During his tenure as president, Slaughter has introduced a number of innovations to the DP training industry, including shared training resources, a quarterly newsletter for DP training directors and the annual DP training survey.

Slaughter is a graduate of the University of Michigan School of Business Administration.



Jack L. Stone is a Washington, D.C.-based educator, consultant lecturer and author who specializes in human connections and training for the electronics industry.

His custom training programs for users of large-scale business systems are in use throughout business and government.

Chipping Away At Productivity

By Jack L. Hancock

Productivity is, or should be, a major concern of the DP manager who must obtain maximum benefits from limited resources. And, as we all know, programmers and analysts are a very limited resource.

I have been in the systems world for more than 25 years and have come to believe that in practice we are only chipping away at the problem of productivity—we are not attacking it systematically.

The conventional tools and techniques for applications development do not provide, nor do they have the potential to provide, the magnitude of productivity improvement we must have if we are going to realize the real value of DP systems in any cost-effective way. It seems that today's approach to systems development is like moving forward on a growth path while looking backwards. Our present approach is based on yesterday's questions and, therefore, yesterday's requirements—not tomorrow's.

Consider the problem of user requirements. A large number of existing management information systems do not provide the full measure of organizational productivity improvement of which they are capable. There are many reasons for this, but I will discuss only two. These two may be the two most important reasons we are not nearly as productive in DP developments as we should be.

First, many systems are based on stated user requirements which, in fact, do not express the real requirements at all. Instead, they are the requirements the user believed to be valid at the outset of design, but which at systems implementation time are found to be either incomplete or partially or wholly invalid.

The second problem follows from the first. After implementation, when the user finds that his initially stated requirements are not valid or are incomplete, he starts the system into that interminable repair, enhance and improve mode of maintenance from which the system rarely ever recovers.

Following the Crimean War, a government commission was created to investigate allegations of poor army medical support to British soldiers. The commission report concluded that the medical service would have been

perfectly adequate if it had not been for casualties. In the system world, our current procedures and practices would be perfectly all right if it weren't for users' requirements.

Two Classes of Solutions

Well, few things are more stimulating than other peoples' calamities observed from a safe distance, and the literature today is replete with examples of "systems failures" which occurred because the user did not provide the designer with his requirements in a clear, concise and unambiguous way and in a language which left little room for misinterpretation.

The same literature offers two classes of solutions to the problem. First, there is much ongoing effort to provide means by which the user can more clearly and consistently state his requirements.

Second, there is acknowledgment of requirement for better tools by which the designer can compensate for the inadequately stated user requirements. Dan Teichroew at the University of Michigan has attacked the requirements analysis problem with his Information Systems Design and Optimization System. Software Requirements Engineering Methodology and Software Requirements Engineering Program are two other systems that tackle the user requirements problem.

These are important initiatives and the resulting tools are, and will continue to be, very useful, but they fail to attack what I consider to be the core problem. It has been said many times that the user has to know what he wants before the system can be designed which will satisfy him. At the theoretical level, one has to agree with that. However, in a pragmatic sense, the user is incapable of knowing his requirements with the specificity that we, as designers, must have in the application of traditional design methodology.

Challenge of Complexity

To begin with, organizations today are so complex and their management is accordingly so difficult that a manager cannot be expected to fully identify system requirements at the outset of the design process. The factors with which management must deal and upon which it must make decisions are so complex and numerous, and so un-

(Continued on In Depth/8)

Conventional techniques of applications development do not—and cannot—provide major gains in productivity, contends the vice-president of information services at Chemical Bank. New tools are required: impact analysis, simulators and disposable software breadboards.

IN DEPTH

(Continued from In Depth/7)
controllable, that decision-making is probably even more an art today than it was a half century ago.

One manager stated it well when he said that a few years ago management was, in fact, a process of achieving specific objectives while fending off change. Today, however, management is more a process of achieving stated objectives, while encouraging and acquiescing to some changes which inevitably occur and integrating these

changes into the process. The manager today, in effect, manages change, not the status quo.

The number of variables with which the manager must deal are so large, in many cases so unpredictable and yet so interrelated that to expect an accurate and complete statement of system requirements at the beginning of the design process is asking the impossible.

Ask a prospective user of an automated system what he needs from a system which is to be designed for him.

He can reply "I don't know." He can say, "I need just what I get right now, but I need it to be more accurate and more timely." Or, he can say, "I need everything you can give me."

The first answer, "I don't know," probably most accurately reflects reality but is not a very satisfactory answer to the user or the designer. Furthermore, it is certainly a very disillusioning answer to those who think of the management process as being highly deterministic.

The second answer, "I need just what I get right now, but I need it to be more accurate and more timely," is a safe one because it requires a minimum of change and innovative thinking. Hence, it certainly is a cost-out and very clearly will be a costly response because post-implementation changes will be many, costly and will lead to the conclusion of users and management that the system has not been successful.

The third answer, "I need everything you can give me," is probably not at all uncommon, although the precise response is likely to be a bit less grandiose. Nonetheless, this kind of response and the resulting requirements statement lead to those very massive and costly systems failures which we know all too well. I call this approach "The Accident Waiting to Happen."

The first answer, "I don't know," is an honest one, but if accepted and applied in the way we traditionally handle requirements, inevitably leads to what we know as the "inadequate user requirements problem."

Why is this an honest response? Simply because the user in most organizations is dealing with many unknowns. Here are two analogies which may help to illuminate the user requirements problem.

Carte Blanche

If you invite your five-year-old child into the kitchen and say to him, "You can have anything you like for dinner," it is certainly not likely that he will request veal comble or filet mignon and a vintage wine. He is more likely to ask for candy followed by an ice cream dessert because he can only respond with those likes and dislikes with which he is familiar or has had experience.

Similarly, in many cases the manager is being asked to deal in areas with which he has little prior information or experience and, therefore, a limited base on which to build his requirements for the future.

Now, on the other hand, if I were to say to you, "I want to invite you to a restaurant this evening. Please describe your precise taste. Based on this description, I will order your meal and you can be reasonably assured you will like it," you would be hard pressed to describe your tastes. And I would not expect you to be able to. Instead, I would say something like, "I would you care for Southern-style cooking."

(Continued on In Depth/10)

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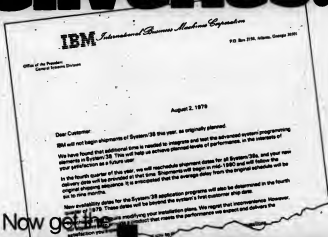
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In Depth/10

(Continued from In Depth/8)
Italian or Chinese?" And so forth.
We might even negotiate a little to ensure that I understand your general desires based on your response. I would take you to a restaurant serving the general type of food you indicated as your preference. You would then be given a menu containing a list of foods with certain taste characteristics and you would select from that menu. If you were unfamiliar with the taste characteristics of a given dish, the

waiter would describe them to you.
After an iterative and normally open and free process, you would order your meal.

In this analogy, you have stated your requirements, but you have not done so in a vacuum. You had a "menu" of suggestions to follow. The menu not only served as a guide to prompt you in ordering but also served to tell you what was possible within the "state-of-the-art" of that restaurant. The same sort of thing ought to apply to

some considerable extent to systems requirements and design. But our traditional means of requirement statement differs greatly from the process of specification by menu.

Excessive Maintenance

There is no need to dwell on the fact that our traditional methodologies lead to a not inconsiderable postimplementation "maintenance" effort, which is far in excess of what can properly be considered acceptable and what we in

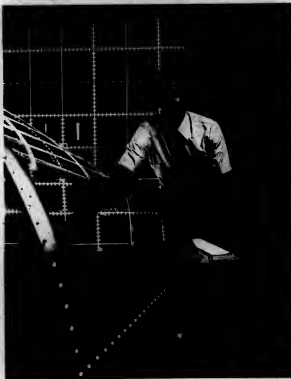
the design community think desirable. It is not uncommon to find postimplementation maintenance costing 60% to 80% of the total design effort.

And this is "maintenance" used in its very poorest but most common sense — not the effort to correct errors, but rather maintenance in the sense of repair, enhancement and improvement. In the best sense, I often feel that in the best systems traditions, we do little more than leap heroically from crisis to crisis.

A review of the systems change requests for a large number of systems shows that a majority of change effort is involved in incorporating system features and procedures which in retrospect the user would like to have specified at the outset, but did not. These are not changes as a result of a well-planned, long-range system development program aimed at modular improvement on a preplanned basis. Instead, these changes are almost extemporaneous; we are forced to make them after implementation either to correct system deficiencies or make the system more responsive to the user.

This suggests that those of us who work in the technology of systems design should concentrate much of our attention on looking at the current methodology in its entirety, that is, in the classical systems sense rather than in the micro sense. Put another way, we should look at ways to improve the ability of the user to specify those requirements he believes to be valid early in the process, but to withhold commitment on all other requirements until he is in a position to validate them. This idea explicitly acknowledges that the manager lacks full knowledge. And it also acknowledges the permission

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IN DEPTH

ability of redefining and refining requirements previously stated as the design proceeds. This latter process should occur based on feedback from the designer to the user as development proceeds. It should not be on the whim or fancy of the user.

Iterative Design Process

The idea of the iterative process of systems design is critically important. We know that effective design is achieved only as a result of a feedback

arrangement between designer and user. Traditional methodology provides for the feedback loop to be very long, beginning with the initial requirement statement and looping back after systems implementation. Surely, structured technology, with the provision of walk-throughs, has contributed to an improved iterative process, but it has not greatly changed the lack of timely feedback.

Initial user requirements will typically not be an accurate reflection of

what the user needs and they will change as the user gets an opportunity to assess each requirement in an operational mode. Consequently, the sooner we can permit him to make that assessment, the less costly and the more effective and responsive and, therefore, the more potentially productive the system development process will be.

In keeping with this thesis, one might use the term: "Half-specified requirements." It means a user should furnish the designer with his requirements as

he sees them at the time, paying a minimum of attention to detail and with full recognition that the requirements may or may not represent his final view.

Further, these half-specified requirements would be based on a question-and-answer methodology not unlike that used in the "invitation to dinner" analogy. In essence, the designer, will be saying, "Give me your general tastes and I will do some initial design (Continued on In Depth/12)"

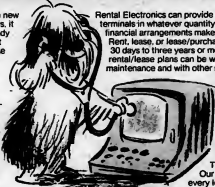
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In Depth/12

IN DEPTH

(Continued from In Depth/11)
and give you a menu from which we can jointly get more specific."

The well-known curve representing a typical system life cycle, with time on the "X" axis and resources on the "Y" axis, shows a sizable amount of time and effort spent in systems definition.

The picture as we know it should be changed, reflecting a reduction in time, and the process should be called "initial systems definition." Final systems definition would follow from that

point, but it would be integrated with the design effort. It would become part of the design phase and would lose its separate identity.

Furthermore, the current life cycle phase, in which specifications are prepared, should be changed to provide instead for a more dynamic specifications process. Under our current technology, as we prepare specifications, the user has little opportunity to analyze the impact of his requirements on overall systems outcome. Furthermore,

he does not see the impact of his requirements until the system is finalized.

Under the current methodology, the system in its final state, that is the state prior to implementation with its documentation, is the first and only complete specification. Unfortunately, it is available far too late in the cycle to permit a thorough evaluation early enough to preclude costly systems redefinitions.

Our use of the term "prototype" in

connection with data systems is amusing. The dictionary gives the definition of a prototype as "the original or model after which anything is formed." The term prototype, in most cases, refers to a full-scale working product but one not intended for fielding. It is intended to be the basis for the system to be fielded.

In our traditional design methodology, however, the prototype turns out too often to be the final product which will be fielded — but, as we all know, fielded with the full expectation that many changes will follow.

To get to the heart of these problems — and to solve them — we need to rethink and significantly revise current methodology. We need to develop new tools and techniques to support this rethinking.

In the early days of DP, the so-called DP analyst was both a processing and a function analyst, and he played a major role in helping the user design his requirements. Over the years, however, a wall has been built between the two types of analysts. The product of the functional analyst is developed and thrown over the wall to the DP analyst. He, in turn, does his thing and throws it back over the wall.

This wall needs to be removed; the two specialties need to be reintegrated. The systems designer needs to become intimately familiar with the functional area in which he is working. And management needs to recognize that this is essential and that it is not an encroachment onto its "turf."

There needs to be a much more direct and personal interchange between designer and user. The half-specified requirements described earlier should be given to the systems designer who would fill in the detail based on his knowledge of the functional area. He would put them into a form from which he could prepare a simulation of that requirement.

Systems Simulators

This leads to a discussion of the new class of tools which I believe are essential. Specifically, I am impressed with the potential of a new kind of systems simulator.

Over the years, the trade literature has contained many discussions of simulations which can be used in software design and evaluation. Unfortunately, most of these deal with deterministic systems or probabilistic systems which are assumed to be in a steady state.

These simulators measure performance relative to throughput, response time, queue times and lengths or resource allocations of existing systems. Few are aimed at assessing systems concepts for which no system yet exists. There are exceptions, but they have been well supported neither in funding nor practical application to real-world situations.

Simulation can be profitably used in systems design. In an inventory control system, for example, we know there are certain basic inputs. We need requests for supplies and receipt infor-

(Continued on In Depth/17)

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(Continued from In Depth/12)
 mation as well as inventory, shipment
 and financial data.

The user, at requirements specifications time, operating in a mode of less than full information, typically specifies many other inputs which he considers necessary. These inputs, when processed in the system, will produce outputs and will generate other transactions which become turnaround documents for subsequent cycles, such as when unit of issue and price changes occur, when substitutes are made, when manufacturer part numbers change and so forth.

When the user specifies the inputs, outputs, relationships between various inputs and the transactions which are to be triggered by the inputs, he has no way of knowing the volumes of the output or the end results of the interaction of the various transactions with each other.

If we can develop practical simulators, we can use them to permit an impact analysis of a target system. Some work has been done on such simulators, for example, the effort reported on in "Behavior Modeling During Software Design" (IEEE Transactions of Software Engineering, July 1978). But to date, efforts such as this are still

being supported only as research undertakings rather than as design tools, and they are getting little funding.

Different Type of Breadboard

After the simulations have been assessed by the user and the systems requirements revised through the aforementioned iterative process, the next step would be the introduction of "breadboards" of the key modules of the system. We are all familiar with the breadboard idea for hardware, and we know that the term has been used in connection with software.

But the objection to the software breadboard in the past has been that it has not been a true breadboard, but rather has been a final product not yet extended. This is unlike the equipment breadboard, which is typically built in a laboratory to validate design and upon which decisions are made regarding future production, but it is not the final product.

The software breadboard I have in mind is much different from these other software breadboards. It is a programming product developed with little consideration of programming efficiency, computer runtime or cost effectiveness of the breadboard per se. Key modules in the system would be

programmed in a language which may not, indeed probably is not, the language which will ultimately be used to produce the system. It would be a "quick and dirty" effort, designed to produce an operating model patterned after the user's requirements.

Again taking the inventory control system as an example, the breadboard might be produced for the edit module, certain logs in the inventory cycle and the report output module. We would not breadboard the entire system. The breadboard would not be a final specification, but it would be used by the designer and the user to certify the validity of the concept as the basis for producing the final specification. I want to stress that the breadboard would be "throwaway code" and therefore we would not be worried about efficiency.

Many of us are familiar with computer-aided design approaches in urban planning and architecture. I believe we can capitalize on this work to help us develop the breadboard concept.

Following this concept of a more radical approach to systems design, you may have noted that at this point we still do not have a full specification. As pointed out, using the typical design

methodology the only real system specification is the finished system with its documentation.

Frank Bernstein of Calculon Corp., a Washington, D.C., design firm, has said that user requirements in our traditional methodology can be likened to the dot-to-dot maps on placemats for children in restaurants. If the child connects the series of numbered dots correctly, he gets a picture. Bernstein compares user requirements to the statement by the proprietor of a restaurant that he has a requirement for a picture of a clown. The analogy for the specifications is the designer placing the numbered dots properly, and the final product is the connected dots.

This analogy is intriguing because one quickly recognizes that the user will not know if he is satisfied with the product until after all the dots have been connected and he gets an opportunity to see the picture. If the picture is not a good likeness of the object, the picture might have to be totally redrawn or more dots added to produce a better image.

The breadboard idea described here would furnish the user with the sketch of the object on the breadboard. If it met his requirements, it would be polished.

(Continued on In Depth/18)

Attention—Operators and Systems Programmers:

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Agenda

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A25

IN DEPTH

(Continued from In Depth/17)
ished up by proper documentation and efficient coding. Thus, in one manner of speaking, we would design in the reverse of the way we do today.

How does one go about building a breadboard? As a possibility, one can borrow from the ideas of Harland Mills of IBM and Fred Brooks of the University of North Carolina. The breadboard master would be the "chief of chiefs" in the programming team concept. He would be among the most

talented and most competent programmers in an organization.

He and his small team would be allowed to operate outside of any standards. They would be given software and design tools much different from those furnished to the applications programmers. This team would write in a language which might be different from a target language and for a processor that might be different from a target machine. None of this would matter because we are dealing with a

throwaway code.

When the breadboard is completed, it would be tested for accurate output only through those legs of the program which have been breadboarded. All possible outcomes would not be tested.

The finished breadboard would be displayed for the user so that he could either approve, disapprove or request changes. After all the changes had been made and the user had expressed his approval, the breadboard, along with the necessary documentation,

would be given to a final design and programming group to be used in preparing the final design specifications.

These programmers would not try to repair, modify nor enhance the breadboard. It would simply be discarded when no longer needed.

We began to do some of this in the Army organization at which I was last assigned, and we have now undertaken a limited effort at Chemical Bank.

Important Point

One point is very important: I am convinced that the methodology of structured design and programming is effective and that its use will continue to expand. (We are employing structured technology in the classical sense at Chemical Bank so I am not proposing to replace it by the use of simulation and breadboards.) Structured technology can be effectively complemented by the application of these two new types of tools.

Productivity from systems is essential to organizational productivity. I believe that the concepts described here can result in systems which offer the potential of far greater productivity than those we now produce with a more traditional design methodology.



Jack L. Hancock is vice-president of Chemical Bank of New York. He heads the Information Services Group, the centralized organization element responsible for design programming and implementation of DP systems and for data and voice communications of the bank.

Before joining Chemical Bank, Hancock served in the United States Army, retiring from that service as a Major General.

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One With Floppies, One With Hard Disk DEC Builds Micros Around PDP-11/23

MAYNARD, Mass. — Digital Equipment Corp. has introduced two microcomputer systems, one with floppy disk storage and the second with hard disk storage, that are built around the firm's PDP-11/23 processor and can include up to 256K bytes of memory.

The PDP-11/23 and PDP-11/23 were designed for engineering, scientific or commercial environments and come with either a hard-copy or CRT terminal. Both systems are high-end members of DEC's packaged microcomputer systems line; each has approximately 2.5 times the execution speed of the company's entry-level PDP-11/03-based packaged system, a spokesman claimed.

The PDP-11/23 consists of two 8K02 floppy disk drives and the PDP-11/23 processor with 128K bytes of memory, expandable to 256K bytes. It is housed in a 30-in-

high cabinet and can be fitted with an optional workstation desktop attachment, the spokesman noted.

The PDP-11/23 has a 40-in.-high cabinet for the processor and the same memory configurations, but employs two RL01 hard disks in place of the floppies.

Software for both systems includes DEC's RT-11 operating system, programming language compilers, editors and utilities. The PDP-11/23 also runs under the multiuser, multitasking RSX-11M operating system, which allows for such compilers as Basic-Plus-2, Fortran IV-Plus and PDP-11 Cobol, the spokesman stated.

Both machines can act as software development systems for DEC's PDP-11/03 and LSI-11 microcomputers. The PDP-11/23 is compatible with PDP-11-based minicomputers at the operating system level.

Scheduled to be shipped about the first quarter of 1980, the cost of the PDP-11/23 begins at \$15,150; prices for the PDP-11/23 start at \$20,750. Additional information is available from DEC at 146 Main St., Maynard, Mass. 01754.

System/34, 38 Get Matrix Printer

SANTA ANA, Calif. — A 200 char./sec matrix printer for use with IBM System/34 and System/38 processors has been announced by Memorex Corp.

The first matrix printer offered by Memorex, the Model 2056 features a print head advance of 60 in./sec and a paper slew rate of 20 in./sec. It incorporates a 7 by 9 matrix, with a graphics set of 96 characters.

A choice of either 10- or 16.5 char./in. permits the selection of the appropriate horizontal spacing, according to a Memorex spokesman. Underlining is said to be accomplished without descenders running into other characters.

The printer can accommodate forms ranging in width from 2- to 16.5 in. The unit has both bottom and rear paper-loading capabilities. A paper-sensing alarm alerts the operator of low-paper and paper-out status.

The unit's straight-wide print head is said to reduce heat and overall wear on the print mechanism. It can be replaced by the operator.

The Model 2056 matrix printer costs \$5,975 or can be leased on a two-year contract for \$185/mo, including maintenance. Memorex's Business Systems Division is located at San Tomas at Central Expressway, Santa Clara, Calif. 95052.

Ever-Growing Future Forecast For Scientific Desktop Minis

By Jeffrey Beeler

CW West Coast Bureau

ANAHEIM, Calif. — Although their size and cost will remain about the same, scientific desktop computers will continue to grow in speed, main memory capacity and peripherals performance during the next five years, a Hewlett-Packard Co. sales executive predicted here recently.

By 1984, desktop systems will accommodate main memories ranging from 65K to 284 bytes, floppy disk units storing up to 5M bytes and hard disk units as large as 500M bytes, according to John Boose, sales manager of HP's Desktop Computer Division.

Today's desktop processors, by contrast, provide 64K to 49K bytes of user main memory, floppy disk units with capacities ranging from 512K to 2M bytes and hard disk units storing 5M to 120M bytes.

During the next five years, desktop systems will also achieve roughly the same operating speeds as today's superminis and acquire bubble memory storage units with 10 times the performance of current floppy disk offerings, Boose predicted at the recent Mini/Micro Conference and Exhibition here. Despite all these technological advances, however, the systems will remain as "friendly" as ever to operate, he added.

In a paper entitled "Scientific Desktop Computers — Past, Present and Future," the HP sales manager told listeners the IEEE-standard interface will continue to dominate

the machines five years from now. Boose based his projection partly on his belief that desktop computers will play an increasingly important role during the next five years in distributed communications.

"They should begin to have foreground and background capability while operating as a node to a computer," he said. "The ability to develop programs for controlling sophisticated instruments while running an experiment at the same time could be a very important application for desktops in the future."

Other applications that will probably play an important role in future desktop systems will include integrated circuit design, image processing and mechanical design.

In all three anticipated applications,

(Continued on Page 78)

TI Family of Bubble Memories Offers 11.2 Msec Access Time

DALLAS — A family of physically and electrically interchangeable magnetic bubble memories with up to one million bits of storage has been introduced by Texas Instruments, Inc.

The memories have an access time of 11.2 msec, reportedly twice as fast as TI's previous bubble memory. The family approach is said to allow designers to vary system

storage capacity by interchanging the bubble devices.

The first two devices — to be available as board-level systems — are the TIB1000, a binary 1M-bit unit organized as 512K by 2, and the TIB0500, a 512K-bit device with a 512K by 1 organization. Available in the second quarter of 1980 will be a binary 256K-bit device compatible with the two larger devices, according to TI.

Bubble domains for all new memories are 2 microns in diameter, a size that allows increased density of bits on each chip, according to the company. The TIB1000, for example, achieves more than one million bits of storage in a 149,000 square mil chip area — less than one square centimeter — and other members of the family are scaled accordingly.

The TIB1000 has a maximum nonvolatile storage capacity of 1,229,400 bits, a portion of which is used for redundancy handling and error correction, the firm claimed. The available data storage capacity with error correction capability is 1,049,088 bits, or 128K bytes of storage.

The TIB1000 uses a block-perfect architecture and is organized as two identical sections of 512K bits each, with 300 minor loops per section and 2,048 bits per loop. A page of data consists of bubbles from 256 of

(Continued on Page 79)

Small Business System Bows

WOODLAND HILLS, Calif. — A computer system designed for small business and professional office environments has been introduced by Compal, Inc.

The Model 8200, designed to be "easy to learn and use, compact, reliable and easy to service," offers such applications as word processing, order entry, inventory control, accounts payable, accounts receivable and general ledger.

Other applications available include payroll, sales analysis, communications, professional billing, mailing, data base management and calendaring, Compal said.

The system hardware includes a 280 microprocessor, three universal synchronous/asynchronous receiver transmitters, 56K-byte random-access memory, 24 by 80 non-glare CRT screen with inverse video, de-

tached keyboard, dual floppy disk drives with 630K bytes of storage and either a 600 word/min typewriter-quality or 150 char./sec matrix printer with forms tractor.

Hardware options include an acoustic modem for communications over phone lines, a sheet feeder and other standard peripherals, the firm said.

Compal supplies hardware, software, training and system support for all its systems, according to the firm. The Model 8200 costs \$11,995 for a configuration with the typewriter-quality printer and \$10,995 with the matrix printer.

Included in the prices are one software package, Basic and assembly packages, desk, reference manuals, starter supplies and delivery from the firm at 6300 Varol Ave., Woodland Hills, Calif. 91064.

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A Little Extra at the Start For Supplies, Accessories Seen Saving in Long Term

By Jeffrey Beeler

CW West Coast Bureau

ANAHEIM, Calif. — By spending a little extra for supplies and accessories at the outset, minicomputer users can "dramatically" cut the long-term costs and risks of running their equipment, a supplies company executive advised here recently.

Most users consider supplies and accessories "pretty dull stuff," the least exciting facet of their computing operations, admitted Kenneth Eldred, president of International Minicomputer Accessories Corp. (Immac). As a result, items like line printer ribbons and media storage systems seldom arouse as much user interest as relatively glamorous subjects like new hardware or difficult application problems.

Unfortunately for most installations, however, the common practice of downplaying the importance of supplies and accessories is a serious mistake and often exacts a heavy toll in user suffering. "Little things like a worn-out ribbon or a misplaced floppy cause as much downtime as equipment failure or programs that refuse to run," Eldred said at the recent Mini-Micro Conference and Exhibition here.

Multipoint Plan

To help users minimize the chances of a serious computing disruption, therefore, the Immac president outlined a multipoint plan for improving the supplies-and-accessories side of minicomputer system management.

First, he said, user should maintain a backup supply of frequently used items like printer ribbons, paper, magnetic media and cables. Such a reserve will permit users to take advantage of the favorable rates associated with large orders, and it will allow a site to continue running even if its supplies run out before the next scheduled shipment arrives.

A stockpile will also eliminate expensive emergency shipments, which account for almost a third of all the minicomputer supplies and accessories order, Eldred said.

Second, he added, users should equip their computing sites with furniture specially designed for such locations. By placing CRT terminals on terminal stands instead of standard business desks, for example, users can ease data entry and thus speed throughput, cut errors and minimize operator fatigue.



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Cabinets with rearrangeable shelves, meanwhile, will be necessary to accommodate disk packs and cartridges, printout binders, systems manuals and magnetic tape.

Ten Mile Away

Third, as a security precaution, users should make backup copies of all their key data files and then store the disk- or tape-stored information off-site. "Several studies have suggested you can obtain more than 90% protection against catastrophe or sabotage by locating files at least 20 miles from your primary location," Eldred observed.

Fourth, the company president urged users to adopt storage techniques that will speed employee access to data and documentation. For frequently used material, copying tapes should provide loose-leaf binders with special pages for floppy disks or cassettes; bookshelves with labeled, color-coded printout binders; and desktop racks for reels of magnetic tape, he said.

For archival data, storage techniques should stress protection and information density. A "clean room" storage cabinet, for example, holds up to 400 floppy disks in its two drawers and incorporates an air filter to repel dust and other magnetic media contaminants, Eldred said.

Annual Contract Urged

In other remarks, the Immac head advised users to negotiate an annual supplies-and-accessories contract based on their anticipated needs.

"This way, you will be sure to get the most favorable prices available, and, in many cases, can arrange for automatic shipments of heavily used items," he explained.

Novice users, he added, should make their first supplies-and-accessories orders large enough to hold them for a while, until they can accurately gauge their long-term demand.

CMI Builds Disk For DEC PDP-11

WALTHAM, Mass. — Cambridge Memories, Inc. (CMI) has introduced a semiconductor disk subsystem that is a direct replacement for Digital Equipment Corp.'s RK-05 disk unit and is compatible with DEC's RK-11 disk storage software.

The CMI-05 Semidisk is said to increase the performance of DEC's PDP-11 minicomputer systems by providing access times of up to 500 nsec and transfer rates of 2,200K bytes/sec. The fastest access and transfer speeds of the RK-05 disk are about 70 msec and 180K bytes/sec, respectively, a CMI spokesman added.

The disk subsystem includes a controller. Its 1M-byte memory capacity is expandable to 4.3M bytes in 256K-byte increments.

The unit comes with built-in error correction, a write project feature and a built-in maintenance capability. Contained in a 19-in. rack-mountable chassis, the subsystem is priced at \$19,500 from CMI at 360 Second Ave., Waltham, Mass. 02154.

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Future for Desktop Units Healthy

(Continued from Page 75) desktop systems will increasingly take advantage of color graphics, which will enhance CRT terminal displays by highlighting significant details, Boose said.

Among their other technological improvements, the desktop computers of the future will sport an enhanced version of today's Basic, with Fortran and Pascal as their most likely second languages, according to Boose.

By 1984, desktop systems will also boast 750 char./sec matrix printers, and 650 line/min thermal printers, he added. Current matrix and thermal models, by contrast, can operate only as high as 180 char./sec and 500 line/min, respectively.

Most Significant Advances

Turning his attention from the future to the present, Boose identified memory and speed as the areas where the

most significant desktop computer developments have taken place during the last five years.

Today's desktop models operate about 10 times faster than their 1974 counterparts, he said. They also offer as much as 14 times more user memory than their five-year predecessors, which store only 1K to 32K bytes.

But the rapid pace of development in desktop computer systems has not been confined just to the processors themselves. A similar flood of advances has also swept the systems' peripherals, Boose noted.

CRT terminals have gained a graphics capability. Tape cassette units have given way to 3M Co.-type cartridge systems that store three to four times more data and gain access to it 15 times faster than their predecessors.

Matrix printers have boosted their output sixfold to 180 char./sec, and thermal printers have doubled their speed to 480 line/min.

Other major desktop computer advances since 1974 include the emergence of the IEEE-standard interface, the burgeoning growth of floppy disk units, the addition of sophisticated error checking, the acquisition of 9600 bit/sec synchronous communications and the introduction of plotters that can produce multicolor graphics without having to stop for a pen change.

TI Doubles Bubble Times

(Continued from Page 75) the loops, while 18 of the remaining loops are used for error correction information and as many as 26 are allowed to be defective, the firm said.

The 11.2 msec access time exists at 100 KHz bubble field frequency; the device's data rate is 160K bit/sec.

Initially, the TIB1000 and TIB500 will be available for evaluation, or design-in, as a complete system in two board formats. The 512K-bit TIB5005 and 1M-bit TIB5010 — both 4-in. by 6-in. boards — and all support integrated circuits will be available in the fourth quarter at a minimum size configuration for a half-million or million-bit memory. The TIB5005 will cost \$2,100 and the TIB5010 will cost \$3,100.

In addition, two TM990 microcomputer-compatible memory subsystems with 1M-bit and 2M-bit storage capacity will be available in the first quarter of 1980. Designated the TIB8910 and TIB8920, the units will also include all support integrated circuits and error-correction capability. TI said from P.O. Box 225012, M/S 308, Dallas, Texas 75265.



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National Semi Puts PDP-11 RAM on One Card

SANTA CLARA, Calif. — A 256K-byte dynamic NMOS random-access memory (RAM) board that is compatible with Digital Equipment Corp.'s PDP-11 family of minicomputers has been announced by National Semiconductor Corp.

Offered as a direct replacement for DEC's MS11 series memories, the NS11L can be used with PDP-11s op-

erating on standard, modified or special buses, according to National Semi. The board's advantages lie in its containment of 256K bytes on a single, one-slot hex-wide card, the firm claimed.

The NS11L is said to use a single +5V, reportedly simplifying its use in systems requiring battery backup. In addition, the memory features a parti-

tioned power plane that minimizes battery drain by powering only the memory elements and refresh circuitry.

Furthermore, the board assures high throughput rates by using address and data latches that isolate the memory from "spurious" bus noises and permit the bus to be released within 100 nsec on write operations, National Semi said.

Read operations are completed in 300 nsec, a speed claimed to be more than 50% faster than comparable DEC memory. Memory cycle time is 450 nsec.

On-board parity generation and check circuitry reportedly eliminates the need for a separate M7850 controller card, freeing a slot in the chassis

and reducing overall system cost.

The NS11L can be operated with, or in place of, MS11 series memories in DD11-CK, DK or PK backplanes. Address blocks are switch-selectable in 4K increments up to 2M words. Memory for device addresses can also be reserved by setting switches.

Compatible with PDP-11 hardware, software and peripherals, the NS11L memory can be installed and operated without special tools or adjustments, the firm said. All RAMs are socketed for easy installation, and a spare RAM is stored on the board.

The NS11L costs \$5,750 for the 256K-byte configuration, with OEM quantity discounts available from National Semi at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

DG Eclipses and Novas Get Multidevice Controller

WOODLAND HILLS, Calif. — A multidevice controller for Data General Corp. processors has been introduced by Codevintec Pacific, Inc. (CPI).

The Codevintec CI003 is self-contained on a 15 sq-in printed circuit board and occupies a single slot in a DG Eclipse or Nova minicomputer, according to a CPI spokesman.

The CI003 is said to combine a real-time clock with up to three controllers on a single board. It allows the interfacing of an asynchronous terminal, line printer and card reader with one board.

The crystal-controlled real-time clock provides four frequencies selectable under program control, according to the firm. The line printer control interfaces to the CPU via parallel printer such as those from Centronics Data Computer Corp., Dataproducts Corp., Printronix, Inc., Data 100 Corp. or Tally Corp., the spokesman claimed.

The card reader controller reportedly accommodates True Data Corp. or Documentation, Inc. types of card readers. The asynchronous controller can be used with a teletypewriter, CRT terminal or other serial-type terminal and can operate in either current-loop or RS-232 modes.

Transmission characteristics, device code selection and transmission rate selection from 75- to 9,600 bit/sec can be set by DIP switches, the firm said, and each controller can be set independently to respond to primary or secondary device codes.

Other controllers are available, such as a second asynchronous port or incremental plotter interface. An optional -12V power supply is available for the asynchronous controller, since some DG computers — like the Nova III — don't have -12V.

Centronics 730 Twice as Fast

HUDSON, N.H. — Centronics Data Computer Corp. has doubled the speed of its 730 series to 100 char./sec.

The 730 miniprinters feature a three-way paper-handling system and a 7 by 7 dot matrix print head in addition to an 80-column line length at 10 char./in., a full line buffer and high-speed carriage return.

Fixed pins on the platen accept standard computer-grade, multipart or single-part fanfold paper 9 in. wide from pin to pin.

The prices remain unchanged, ranging from \$995 to \$1,045, depending on the configuration.

Centronics' office is at 1 Wall St., Hudson, N.H. 03051.

The CI003 costs less than \$2,000 and is available from CPI, 6263 Varrel Ave., Woodland Hills, Calif. 91367.

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Eases Peak-Load Period Mini Helps Agency Handle 3,000-Person Tour

By Stan Piltch

Special to CW

NEW YORK — In the travel business, where identical products are sold at the same price, the watchword is service. A year ago, Compass Travel Bureau installed a minicomputer that enabled it to expand its operation, improve customer service and efficiently handle a single movement of close to 3,000 passengers.

Compass has been operating in the midtown Manhattan area for the past 55 years, offering both retail and wholesale travel products. Last year it contracted to handle a special overseas convention involving the transport of almost 3,000 passengers to a single

destination over a 10-day period.

At that time, it had no in-house computers nor was it utilizing service bureaus for any significant applications.

The original plan was to use a temporary work force to handle the peak paperwork periods. After two weeks, the travel bureau discovered that this approach was doomed to failure. The firm was spending an inordinate amount of time teaching the temporary employees its normal office procedures.

Worse yet, because of the indolence of some temporary employees, Compass found it necessary to redo a good portion of the paperwork the temporaries were hired to do.

A computer seemed the logical solution. Compass spent about a month examining the existing software packages and turnkey systems that were being offered to the travel industry.

The desktop computers were eliminated as being too small to handle Compass' overall volume. The time-sharing systems were eliminated as not flexible enough. The airline systems were dismissed as basically reservation systems with the accounting functions added as a marketing afterthought.

It soon became apparent that it would be best for Compass to develop its own software. An IBM minicomputer was selected since it could be rented on a short-term basis. Compass was not yet

convinced that it could justify the cost on a year-round basis.

A System/32 appeared to be the ideal solution but because of the long lead time, Compass installed a System/32 as an interim measure. The configuration consisted of a 16K-byte CPU, 13.7M-byte disk, 150 line/min printer and a Model 3741 key-to-diskette data entry station.

A local software firm, Interactive Business Systems, Ltd., was selected to assist with the programming. This firm had a working knowledge of the travel industry, which proved to be highly beneficial during the design phase.

Preparing for Implementation

As convention registrations began to accumulate and the software was still being coded, Compass decided to capture all available information and later delete any unwanted data.

The complete passenger information was entered using two 128-byte sectors via the 3741. This information included name, address, telephone, roommate preference, hotel grade, meal plan, type of room, departure date, flight schedules, hometown connections, selected touring, insurance coverage, passport information, bus assignments and organization affiliations.

Developed as needed, the applications implemented on the System/32 were confirmations, status reports, hotel usage analysis, itineraries, exception reports, tour manifests, tour code activity, bus manifests, cash receipts, mailing labels, bus passenger lists, identification tags, tour summary reports and profit/loss analysis.

As registrations were entered, a unique ID number was assigned to prioritize the waiting lists (close to 4,000 people actually registered.) Each passenger was sent a computer-generated confirmation slip stating the deposit received, his roommate and the tour options selected. A turnaround document was used to correct any input errors.

The System/32 assigned the hotels and generated rooming lists for the hotels and assigned flights and generated passenger manifests for the airlines. The minicomputer also calculated bus requirements to efficiently move the passengers to and from the convention activities and the sightseeing events.

The system printed complete itineraries and identification tags that were sent to each participant. Mailing labels were also system-generated for all correspondence. Cancellations were automatically filled from the prioritized waiting lists to maximize hotel room utilization. Compass even wrote a program to match roommates.

Invaluable Reports

The management reports generated were invaluable. Which options were most requested? Which tours were most profitable? Which departure dates had the longest waiting lists? Which hotels were most in demand? Compass was able to analyze the efforts of its hard work within days after each departure.

For future reference, Compass printed a demographic breakdown of

(Continued on Page 64)

Peugeot in sixty days."

"There was no need for either accounting or data processing to compromise with either system. Prior to choosing Software International, we surveyed their customers and our 'Big 8' auditors, and were well-satisfied with reliability, field support and system performance."

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System Now Backs 16 Users

George Users Gain Enhancements

LOS ANGELES — Enhancements for Cincinnati Milacron, Inc. George systems — including conversion from RPG-III to RPG-III, handling of up to 16 users and expanded disk storage capacity — have been announced by Multiplex Information Systems.

Coming about one year before Cincinnati Milacron is slated to discontinue its George line of small business systems, the enhancements were specifically developed to "satisfy the growth requirements of George system users and protect their software investment," a Multiplex spokesman said.

The most significant enhancement is the CPU Expansion Kit and Data Base Management Virtual Operating System, which makes the CIP/2200 — or George system — capable of accommodating up to 16 independent users, the spokesman claimed.

The enhancement also allows existing RPG and VDTs pro-

grams to be recompiled to RPG-III and permits existing files to be converted for full use of the data base management capability of the operating system, including dictionary reference of all fields and report generation with English statements.

The enhanced system is said to perform dynamic allocation of disk storage. Files reportedly are protected by log on/password, dictionary privilege levels and multiple update/retrieval file locks.

Field Disk Upgrades

For additional storage to complement the expanded George system capability, Multiplex has developed a universal controller and interface unit that reportedly allows the use of up to four Century Data — Computer

Corp. Trident disk drives as field upgrades for the CIP/2200.

The disk drives are available in capacities of 25M, 50M and 200M bytes, and the controller allows the use of any combination of drives, the firm claimed. All disks are single-cartridge with a removable pack; backups can be made with two disk drives or with one drive and a magnetic tape.

The CPU Expansion Kit and Data Base Management Virtual Operating System costs \$12,500 and the controller and interface costs \$9,250. A 25M-byte disk drive costs \$8,775, a 50M-byte drive is priced at \$10,750 and a 200M-byte drive goes for \$18,500.

The enhancements are available from Multiplex Information Systems, 1630 W. Eighth St., Los Angeles, Calif. 90037.

Board Lets Nova 1200 Run Nova 4 Instruction Set

EL SEGUNDO, Calif. — An option board that allows Data General Corp. Nova 1200 series and D-116/computers to accept the complete instruction set for DG's Nova 4 series computers has been announced by Quentin Research, Inc.

Use of the option board with existing Nova 1200 memories is said to increase the speed of the Nova 1200 by about 25%. If existing memories are replaced by a 32K-word Quentin/memory board, the speed of a Nova 1200 system

can be increased about 40%, to 800 nsec, the firm claimed.

The microprogrammed Quentin Model 2010 is a one-for-one replacement for the CPU board in the Nova 1200, according to the firm. Complete Nova 4 stack, multiple-divide and byte instructions become effective as soon as the board is inserted, a spokesman added.

Carrying a lifetime guarantee, the option board costs \$1,800 from Quentin at 610 Hawaii St., El Segundo, Calif. 90245.

Floppy Storage System Offers All IBM Formats

SAN FRANCISCO — Scientific Micro Systems, Inc. has announced the Model FT02001 floppy disk storage system. Data transfer rates of 19.2K bit/sec and higher are supported, as well as block transfers of data up to 65,000 bytes, the vendor said. The system features all IBM formats including 3740 single density and Diskette 2/2D double-density disks. Recording density is software-selectable from the host processor.

The system was designed to be used with such processors as the Hewlett-Packard Co. 3000 and General Automation, Inc. mainframes.

A two-drive system with single-head disk drives costs \$3,700. This provides 1.2 M bytes of storage in the double-density mode.

Optional double-head drives provide 2.5M bytes of storage and cost \$400 per drive.

Quantity discounts are available from Scientific Micro

Systems' Customer Service Department, 777 E. Middlefield Road, Mountainview, Calif. 94043.

Interface Fits Itoh Printers

ALLSTON, Mass. — A microprocessor-based, single-board interface designed for use with C. Itoh Electronics, Inc. Epson 200 series dot matrix impact printers has been announced by the Interface Electronics Division of Capital Circuits Corp.

The Model 210 incorporates head drivers, control logic and interface on a single board with selectable serial or parallel input to drive the 27-column Model 210 printer under software control.

Versions of the interface are also available for Itoh's Model 220 journal printer and Model 240 ticket printer. The interface costs \$180 from Capital Circuits, 24 Denby Road, Allston, Mass. 02134.

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DENVER — While credit cards, charge accounts and other "plastic" forms of payment may be quite flexible, they can sometimes cost customers precious time as they wait at the sales counter for proper authorization.

The delays can range anywhere from a few seconds to several minutes. This variable time can be better spent by both shoppers and retailers in the actual business of buying and selling merchandise on the store's floor, according to Howard Horton, director of DP for Neusteters Department Stores here.

Neusteters recently installed an Infocrex, Inc. System 3000 minicomputer-based file management system that can check the customer's credit history and deliver authorization in about 10 seconds.

The system handles up to 32 simultaneous terminal operators and employs preprogrammed instructions, so "non-computer" personnel can compile and execute a variety of file management applications.

"This has given us absolute control over credit," Horton said. "When the most recent sale is entered, it is automatically updated, so if the customer were to go to another department five minutes later and make another purchase, the previous sale is already recorded and tallied on the account."

While salespeople and customers only see the keyboard end of the credit system, the all-important data is stored on a large disk — similar to a long-playing record — in another part of the store. Here, operators can access the system through other keyboards, as well as type in new information and print and delete customer records, Horton pointed out.

Expensive Expansion

Previously, Neusteters had been using a key-to-disk and NCR Corp. 200 system for its data entry applications. The system was programmed to perform only certain functions, and if the store wanted to expand that system it would have incurred expensive programming and development costs.

Expanding such a system would have involved attaching workstations to a large central processor. It might also have been necessary to hire outside programmers to work solely on system development for a year or more, Horton pointed out.

"First we looked at expanding our present system, but we had a problem in that we are a relatively small shop with only one programmer. We could not afford a large time and money investment in programming, software development and all the typical complications and expenses associated with building an on-line system," he said.

"We also thought about upgrading our credit authorization system

and looked at Datatrol, Inc. and TRW, Inc. credit authorization systems, but the costs of maintaining terminals at each department's station and programming eliminated those alternatives."

Since the Colorado-based department store was already using some Infocrex equipment in its sales department, company executives decided to stick with that vendor, and the System 3000 was installed and operating within a few weeks.

Neusteters' programmer worked for one week to create a master file of all charge accounts. The programmer had only to establish what information was to be included in each file, then create a master file of account numbers and related information.

"When a clerk calls from the floor to authorize a sale, the call is routed to one of three terminals," Horton noted.

"Operators enter the account number and the file is brought to the screen within five seconds, displaying the latest transaction the customer made and the customer's credit limit. If the current sale is still under the credit limit, the system will assign an authorization."

Supervisor's Decision

"But if the customer is over the limit or is having billing problems, the system will display an error message and the supervisor can bring up the information on his terminal and make a decision."

Another feature of the Infocrex credit

system is its ability to mathematically balance accounts for auditing sales checks.

With the old system, operators had to transfer the raw data from store-generated documents to magnetic tape, the medium accepted by the store's computer. That data was then compiled into readable and organized reports, Horton explained.

In addition, all sales had to be audited with keypunch equipment, which included collecting the day's sales tickets and running totals using adding machines. The information from the adding machine tapes and sales tickets were then keypunched, and a magnetic tape was produced and submitted to the NCR mainframe.

(Continued on Page 85)

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For Electrical, Mechanical Firms Turnkey Designed for Contractors

ACTON, Mass. — A minicomputer-based turnkey system for electrical and mechanical contractors, designed to perform such tasks as estimating and job cost control, has been introduced by Construction Data Systems, Inc.

Based on a Digital Equipment Corp. PDP-11/24 minicomputer with 256K bytes of main memory and 56M bytes of disk storage with dual DEC RK07 disk drives holding 56M characters, the CDS-11/M system includes three to eight VT-100 terminals and either a 180 char./sec./300 line/min or 600 line/min printer.

The interactive, time-sharing system was designed to handle billing, accounting and asset management, in addition to estimating and job cost control, according to the firm.

A key feature of the package is its reported ability to produce multicraft, multiunion and multistate payrolls, including union reports, certified payroll and tax reports with W-2s.

The system also handles check processing up to several thousand transactions per month, receivables accounting and aging reports, the firm said.

Construction Data Systems is providing design, development, installation and custom software application support, while software maintenance and update services will be provided through a CDS-11/M users group.

The CDS-11/M, including 12-mo support service, costs less than \$100,000 for entry-level configurations, including three terminals and 180 char./sec printer.

A smaller version, currently in final testing, will soon be available in the \$15,000 to \$30,000 range, according to the firm. That system will be based on DEC's PDP-11/03 or PDP-11/23 minicomputer and will include both disk and floppy drives and one to four LA-120 hard-copy terminals.

Construction Data Systems, Inc. is located at 403 Massachusetts Ave., Acton, Mass. 01720.



Construction Data Systems, Inc. CDS-11/M

24-hr. data pick-

Mini Helps Travel Firm

(Continued from Page 81)

its passengers to determine which local advertising efforts generated the best response.

All clients on the waiting lists and those who were forced to cancel were placed on a special mailing list to receive information on future tours to the same destination. A profile was also kept on each passenger who did attend the convention to be used for selective promotional mailings.

Most Effective Approach

Compass was able to efficiently handle a peak load with a minimum of temporary staffing. There would have been no feasible way to manually prepare and distribute travel documents in detail to 3,000 people over such a short period of time.

In addition, having a timely analysis so soon after the event permitted Compass to plan effectively for the next departure.

As a by-product of its success, Compass has begun offering this data processing service to other travel agents who have large group movements over short time spans, although it does not intend to invest in or develop permanent computer systems or hire specialized staff.

Pilch is president of Compass Travel Bureau.



Shoppers Get Credit Approval in 10 Seconds

(Continued from Page 83)

"Usually the totals did not balance because of clerical errors along the line," Horton said. "The entire batch then had to be rechecked by a second group in the audit department, sales tickets had to be pulled, cards repunched or data rekeyed, then the batch had to be run again on the mainframe."

The System 5000 already incorporates the basic account-

ing software, which means it has the ability to store, access and update information without programming.

"All we have to do is to specify the information we want for each file group and to program the logic steps to edit fields," Horton stated. "This usually takes no more than eight hours to have a program up and running."

Horton pointed out that the conversion from basically a

keypunch system to the System 5000 caused no training problems, and the department store was even able to reduce its DP staff from six dedicated operators to five.

"We had an initial training session that lasted about a day, and shortly after that the operators were using the system for credit authorization — our first application," he said.

With most store operations under the DP belt, Neusteters

is now planning innovations that will further refine its data entry operations such as a stockkeeping and unit-control merchandise marking system. Under the system, one eight-digit number will fully identify an item, reducing key-strokes for data entry and the amount of writing on the sales tickets by clerks. Horton observed that "Our previous system had no capabilities to perform a task like that."

In addition, the planned merchandising system will result in a massive reduction in the amount of internal paperwork, further freeing Neusteters' sales force to do what management intended it to do — serve the customer.

With the conventional system, the buyer created a purchase order that was duplicated and sent to the manufacturer, the marking room and then back to the buyer for reference. When the merchandise was received, the order was pulled and merchandise memoed in. Nine photocopies of the memo were made. These memos were then sent to DP and inventory departments and to each branch store.

Using the new system, "the purchase will be memoed in and sent directly to data processing," Horton claimed.

"The information will be immediately entered into the system, and [merchandise] tickets, transfer sheets and inventory ... are updated in one operation."

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French Flag Waves Behind DP Industry

By Marcia Blumenthal
CW Staff

PARIS — Although some vendors here tend to minimize the French government's financial support of the computer industry, one Ministry of Industry official interviewed recently was candid about the government's interest in the computer industry.

That interest was quite evident at the Salon International de l'Organisation de la Communication et de l'Organisation du Bureau (Sicob) — the major French trade show — which was held here late last month. President Valéry Giscard d'Estaing visited Sicob and, in a special address there, praised the country's DP industry for making France the number two exporter of computer goods and awarded high national honors to three ex-

ecutives of Compagnie Internationale pour l'Informatique-Moneywell Bull (CIIB), France's largest computer manufacturer.

Since 1966, the French government has spent about \$1.5 billion to support the industry, according to Jean-Claude Pelissolo, director for the electronics and computer industry within the Ministry of Industry.

Most of that money was spent over the years to nurture the development of CIIB, which today holds a 27% share, by value, of the French computer market, Pelissolo said.

In contrast, IBM France, which constituted 71% of the French computer market in 1971, saw its share of the market dwindle to about 28% in 1977 and then drop

(Continued on Page 92)



CIIB Photo by M. Blumenthal
Jean-Claude Pelissolo

Workers Demoted, Dismissed Intel Deal Stirs Dissension at National Semi

By Tim Scannell
CW Staff

SANTA CLARA, Calif. — While National Semiconductor Corp.'s recent takeover of Intel Corp.'s financially troubled Data Products Group seemed to go smoothly enough, there is dissension in the ranks of National. Semi people affected by the transfer.

Nearly 1,700 Intel employees have filtered

into National Semi under the umbrella of the newly formed subsidiary, Advanced Systems Corp. (ASC). A number of systems engineering and marketing regional managers who worked for the Santa Clara-based firm have been shuffled to lower corporate positions or are on the verge of dismissal, according to reliable sources.

At least one marketing manager who origi-

nally came from Intel and then covered a multistate region for National Semi was offered a position as a point-of-sale terminal salesman in another part of the U.S. after the takeover. A systems engineering manager whose territory was nearly half the country was demoted to a systems support representative under an Intel boss — a position in what is considered to be "about the lowest form of field support they have," one National Semi manager said.

Employees Not Informed

As the National Semi-Intel deal unfolded, "almost" without exception, all the people that were originally with National Semi either got let go or were given some ridiculous demotion," he continued. "At this point, some of them still don't know what they're doing... they're walking around and nobody's talked to them at all."

All together, some 15 to 20 National Semi employees have been replaced or, are now under the wings of Intel workers, he explained. Furthermore, these employees were not informed of the corporate changes by National Semi executives, but rather by Intel heads who passed along the information via the telephone.

He went on to say that many of the marketing managers, who thought that they

(Continued on Page 88)

Citicorp's Proposed DP Arm 'Illegal,' Adapso Tells the Fed

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A continuing controversy over possible encroachment by national banks on the DP services industry is intensifying within the Federal Reserve System.

The Association of Data Processing Service Organizations (Adapso) has asked the "Fed's" Board of Governors for a "formal, trial-type hearing," at which it can contest the proposal by Citicorp to set up, through a new subsidiary, what Adapso terms "a worldwide time-sharing and computer services network."

In a recent filing with the Fed, Adapso

and a half dozen time-sharing firms contended the Citicorp proposal violates federal banking laws that restrict banks to operations "closely related to" or "properly incidental to" traditional banking services.

In February Citicorp proposed to the Fed the establishment of a subsidiary, Citishare Corp., which would provide internal DP for the bank and its other subsidiaries and develop and distribute financial services DP packages, such as financial modeling, loan analysis, accounting and investment analysis and management offerings.

Citicorp also said the proposed subsidiary would make excess computer processing ca-

(Continued on Page 90)

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COMPUTER INDUSTRY

French Industry Associations Demonstrate Clout

By Marcia Blumenthal
CW Staff

PARIS — Like its counterpart in the U.S., the French computer industry is represented by several industry associations. These professional unions, as they are known in France, engage in activities designed to get a fair shake from government.

Last year, these organizations gained a major victory when the government rolled back price controls that had been in effect since 1948.

In particular, these controls had placed a 2% to 3% ceiling on annual increases for service and maintenance. Consequently, many French companies were not terribly interested in servicing their equipment, one industry

official indicated. Moreover, this government practice further squeezed profit margins of French manufacturers — profit margins that typically run 2% to 3% of revenues after taxes.

With price controls out of the way, another major industry concern is making sure the government considers all bidders for government contracts on an equal footing with Compagnie Internationale pour l'Informatique-Honeywell Bull (CII-HB), the country's largest computer manufacturer, according to Jean-Marie Tanguy, vice-president of Club de la Performativité Française. Government purchases of computer equipment represent 30% to 40% of annual industry revenues, one source noted.

Club Peri most closely corresponds to the Computer and Communications Industry Association (CCIA) in the U.S. Like CCIA, which does battle with IBM, Club Peri is comprised of smaller firms seeking their fair share of the market against a dominant competitor.

Concern about competition from CII-HB notwithstanding, Club Peri members are generally the firms with which the government has "contracts for growth." These contracts supply total subsidies of about \$10 million annually for the development of up-to-date products (see related story on Page 87.)

"Quality Label"

Club Peri has 23 regular members and several associate members that join at the invitation of the organization's board. To be considered for club membership, a company must be a French manufacturer, have "a quality label" and have proven itself financially stable, according to Tanguy.

Members' annual revenues range from about \$1 million to \$150 million, with the average at about \$10 million to \$12 million, Tanguy said. His company, Sifena DSI, appears to be typical of the Club Peri membership. Sifena DSI, with revenues of about \$12.5 million last year, manufactures mini systems and stresses communications capability. Tanguy likened his product line to Harris Corp.'s remote job entry systems and Datapoint Corp.'s 2200 and 6000 distributed processing systems.

Club Peri members — all of whom are top executives — meet every two months to exchange ideas on issues, which these days include government contracts, exports and obtaining an adequate supply of semiconductor products and field engineers.

On the export side, one strategy Club Peri members are beginning to use is technical reciprocity agreements with U.S. manufacturers. It is hoped these ventures will lead to marketing opportunities, Tanguy said.

While the U.S. market holds great allure for French manufacturers, they view it as a hard one to crack. One solution seems to be to make OEM sales to U.S. companies; another is to set up a manufacturing arm in the U.S. Logab Informatique, S.A., has been selling its terminals on an OEM basis in the U.S., and Realisations Etudes Electroniques (RZE) has set up a manufacturing facility in Minneapolis. Now 90% owned by CII-HB, RZE sells its Mical 40 and 50 microprocessors in



Jean-Marie Tanguy



Rene Vallet (left) and Jacques Herbat of SFIB

On Photos by M. Blumenthal

the U.S.

Somewhat more established than Club Peri is the Syndicate National des Fabricants d'Ensembles d'Informatique et de Machines de Bureau (SFIB). A manufacturer's group roughly equivalent to the Computer and Business Equipment Manufacturers Association (Cbema) in the U.S., SFIB has 50 members, with about 50% of them involved in computer manufacture, according to Jacques Herbat, president of SFIB.

Unlike Club Peri, SFIB membership is open to companies that are not nationals; NCR Corp., IBM France and Control Data Corp. are members.

Herbat, a former president of IBM France, considers taxes, development of exports and increasing productivity the major concerns of SFIB. Local communities increasingly want to pass the tax burden on to manufacturers, Herbat complained, pointing to the already low after-tax margins of French computer firms.

The main problem is remaining cost-competitive with other countries, he said, adding that today France's costs are "not in bad shape [compared] with the UK and Germany." Although hedging somewhat, Herbat conceded that the French industry was not cost-competitive with Japan and the U.S.

National Semi People Angry

(Continued from Page 87)

would be included in the transfer negotiations, were called back to National Semi's headquarters and reinterviewed for their jobs by David Van Den Berg, the former president of Intel's Computer Systems Division, reportedly destined to head the ASC organization. Basically, "it was a 'what is your excuse for existing' kind of thing," he claimed.

Another National Semi manager, who has worked with the company for more than a year and has been through the grapevine that his days at the firm are numbered, agrees that many National Semi people "have

been left out in the cold" by the transfer. Employees most affected seem to be those managers who originally hailed from Intel before joining National, as well as a number of people who were working on the business and sales end of the firm's medium-scale entry into the market — the NS5400.

"The whole thing smells a bit funny," the manager, who declined to be identified, stated. So far, "National has not taken the time to fully evaluate and review each situation with [these] people, or try to compensate or accommodate their needs in this transition." National Semi could not be reached to comment on the situation.

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Ohio Scientific's OS-65U Level 3 operating system software brings new networking and distributed processing capabilities to microprocessor based computer systems.



Until now, the only alternative for low cost multiple-user computer applications was time-shared systems. However, a serious drawback of microcomputer or mini-computer multi-user time-share systems is the fact that under heavy work loads they slow down to a crawl since the central processor time in such a system is shared by all of the users.

In a microprocessor based distributed processing system, using floppy based microcomputers as intelligent terminals (local systems) most of the work load is handled locally. Overall system performance does not degrade under heavy job loads. Each local system performs entry, editing and execution while utilizing the central data base for disk storage, printer output, and other shared resources.

For more demanding applications it is desirable to have several data bases, each with its own collection of local systems. Such an inter-connected set of data bases is called a network. Each data base and its local intelligent and dumb terminals is called a cluster.

Level II

OS-65U Level 3 now supports this advanced networking and distributed processing capability as well as conventional single user operation and time-sharing. Level 3 now supports local clusters of intelligent microcomputer systems as well as

dumb terminals for this purpose of utilizing a central Winchester disk data base and other shared resources. The system also has full communications capability with other Level 3 data bases providing full network capability. The system utilizes Ohio Scientific's low cost, ultra high performance computer systems throughout for intelligent terminals as well as data bases. This general systems configuration provides a cost/performance ratio never before attained in this class of computer power.

Level 3 resides in each network data base. A subset system resides in each intelligent terminal. Each data base supports up to 16 intelligent systems and up to 16 dumb terminals. However, since dumb terminals can heavily load the system, they should be kept to a minimum. Level 3 also supports a real time clock, printer management, and other shared peripherals.

Data Base Requirements

Minimal requirements for a Level 3 network data base are a C3-C or C3-B computer system with 23 or 74 megabytes respectively, console terminal, 100K bytes RAM and a CA-10X 16 port I/O board for network and cluster communications.

Intelligent Terminal Requirements

Any Ohio Scientific 8" floppy based computer with 56K RAM and one data base communications port.

Connections

Intelligent terminals and networked data bases are connected by low-cost cabling. Each link can be up to 10,000 feet long at a transfer rate of 500K bits per second, and will cost typically 30¢ a foot (plus installation).

Syntax

Existing OS-65U based software can be directly installed on the network with only one statement change! Level 3 has the most elegantly simple programming syntax ever offered on a computer network.

File syntax is as follows:

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DEV E	Local hard disks	
DEV K-Z	Specific network data bases	

Each of up to 8 open files per user can be from 8 separate origins. Specific file and shared peripheral contentions are handled by 256 network semaphores with the syntax `Wait N`
`Wait N, close.`

The network automatically prioritizes multiple resource requests and each user can specify a time out on resource requests. Semaphores are automatically reset on errors and program completion providing the system with a high degree of automatic recovery.



A Typical System

A typical system with two network data bases will have 148 megabytes of disk, four intelligent subsystems equipped with dual floppies, two dumb terminals, a word processing printer, a fast line printer, network data base manager software and 1000 ft. of inter-connecting cable. Utilizing .7 MIPS processors throughout it will cost less than \$50,000 plus installation. GT option computers (1.2 MIPS) can be utilized at a slightly higher cost.

One Step at a Time

Best of all, Ohio Scientific users can develop distributed processing systems economically one step at a time. A user can start with a single user floppy system, add a hard disk, then time-sharing, then a second Winchester data base for backup and finally cluster intelligent terminals to achieve a full network configuration.

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DP 'Encroachment' Contested

(Continued from Page 87)
pacity commercially available from time to time. Citishare would operate in the U.S., Australia, Canada, England, France and Mexico.

'Illegal Competition'

"Approval of the proposed Citicorp application will subject Adapso member companies in the computer services industry to illegal competition in contravention of the Bank Holding Company Act, will deprive them of legitimate business and will dilute, divert and withdraw a substantial portion of the potential and actual time-sharing and other computer services markets to substantial and irreparable injury of the industry," Adapso countered.

Throughout the year, the association has waged a bureaucratic campaign within the Fed to have the proposal rejected or, failing that, to be granted a full hearing to present arguments against the Citishare proposal. Adapso has also asked a House of Representatives banking subcommittee for a "legislative review" of national banks' DP activities [CW, July 9].

The Fed hearing is necessary, Adapso said in its Sept. 21 petition, because "Citicorp has not demonstrated affirmatively [in its filings in support of the proposal] that all of the proposed Citishare service offerings are, in fact and by law, so closely related to banking or managing or controlling banks as to be properly incidental thereto."

It is alarming enough that Citishare "will offer general-purpose as well as financially oriented time-sharing services," Adapso said, arguing that there is no need for the bank to operate even strictly financial DP services. "Existing independent computer service companies efficiently and competently satisfy existing needs for financially oriented computer services."

Cross-Subsidization

In addition, Adapso said, "cross-subsidization of Citishare prices... will result in the reduction of research and development expenditures within the computer services industry," and "entry of the Citicorp subsidiary into international computer services markets will result in the erection of greater foreign trade barriers to American computer service exports."

"Approval of the Citicorp application... will condone in an unprecedented fashion the combination of the banking industry with the information technology industry so as to allow for the undue concentration of economic resources."

Adapso further maintained that "the unrestrained entry of a multibillion-dollar enter-

prise with special government franchise and privilege into the highly competitive computer services industry will result in decreased and unfair competition by means of 'tying effects' and cross-subsidization and the demise of competitors and independent entrants."

'Unsound Banking'

Thrusting the controversy more clearly into the Fed's statutory jurisdiction, the as-

sociation contended "the Citishare proposal will promote unsound banking practices due to the sheer immensity of the financial, managerial and technological demands" of the venture.

Adapso concluded that the arguments in its petition force the Fed, in accordance with federal banking statutes, "to provide a formal hearing on the record at which the adjudicative facts in dispute will be most appropriately aired."

Infomag May Get 'Parent'

SANTA BARBARA, Calif. — Shareholders of Information Magnetics Corp. (Infomag) will meet Nov. 1 to vote on a proposal to form a new parent company, Computer & Communications Technology Corp. (CCT).

Under the suggested plan, Infomag and its subsidiaries would become offspring of CCT. Outstanding shares of Infomag would also be converted to CCT shares, according to E.T. Bahre, Infomag chairman and chief executive officer.

A manufacturer of magnetic disk heads, Infomag recently acquired Zeta Laboratories and Solid State Sources, thereby entering the business of developing and manufacturing microwave components and subsystems for communications and aerospace applications.

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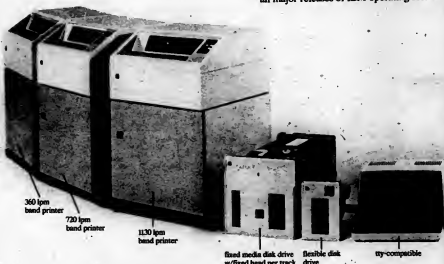
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Syntec Oversees Software Industry in France

By Marcia Blumenthal
CW Staff

PARIS — Although the French software industry may not have benefited from government support, it is generally recognized by experts that the strength of the French software industry has enabled the hardware industry to flourish.

Last year this sector of the French computer industry had sales of about \$1.2 billion,

split evenly between service bureaus and software engineering and consulting firms, according to Jean-François Dubourg, acting director of Syntec, Syntec, the acronym for *Chambre Syndicate des Sociétés d'Etudes et de Conseils*, is the professional union that oversees the interests of the software and services industry.

"In France, anything that has a relation with computers

is political," Dubourg said, explaining government relations, the primary purpose of Syntec's existence.

Last year the Ministry of Industry asked participants from the software and services sector to meet with several government agencies in hopes of ironing out differences between the government and this sector of the industry.

The report emanating from "The Group of Fifteen," as

the industry delegation was known, resulted in the Prime Minister's issuing a letter to government agencies, Dubourg said.

This letter advised agencies to use outside services instead of buying internal systems, unless an internal system was more economical, and to call in consultants to help determine the types of equipment and programs most suited for the needs of a particular gov-

ernment bureau.

If adhered to, the Prime Minister's concision, along with a rollback of price controls on maintenance and service last year, should help plump the software and service industry's revenues.

Another rift with the government concerns the complicated and difficult rules covering temporary labor, Dubourg noted. "In the industry a lot of consulting is long term loans of temporary programmers," he noted, adding that lately the labor department is liberalizing its rules.

Wage Index

Aside from government issues, Syntec spends a lot of time defining the scope of various jobs within the service industry and studying wage levels. Each month the organization publishes a wage index. For example, a programmer with two year's experience in France can expect to earn about \$1,050/mo, and a project manager makes \$2,800/mo on the average, he noted.

Like its counterpart, the Association for Data Processing Service Organizations, Inc. in the U.S., Syntec is concerned about attracting new employees to the industry.

Syntec members visit high school and universities to drum up interest among students. Moreover, Syntec is now pressing government to sponsor a retraining program for professionals displaced from the troubled steel industry.

Zenith Radio Buys Heath

CHICAGO — Zenith Radio Corp. purchased Heath Co. from Schlumberger Ltd. for \$64.5 million.

Heath, which produces and sells do-it-yourself electronics kits and sells minicomputer products for personal and business use, will be operated as a wholly owned Zenith subsidiary. Additional subsidiaries have been established to operate the 55 Heathkit electronic centers in the U.S. plus Canada and Europe.

Zenith said it has arranged long-term financing for the purchase through a private placement with the Prudential Insurance Co.

In a related development, Zenith formed a new division, Zenith Data Systems, to develop Zenith-brand microcomputer products and systems.

These products will be marketed through the Heath Co. catalog and Heathkit Electronic Centers, as well as by selected Data Systems distributors, computer retail stores, lessors and OEMs.

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French Government Backs Industry Strongly

(Continued from Page 87)
two or three more percentage points last year, according to recent French newspaper accounts.

Some of the government's support of CIHB was in the form of a direct subsidy and other support was more indirect: \$1 billion in government contracts were awarded to the company last year, one source noted.

However, the remainder of

CIHB's direct subsidy was dispersed last March, Pelissolo said, adding that the government is now moving in other directions.

'Contracts for Growth'

In particular, the government wants to foster the mini, peripherals and components sectors of the industry. To that end, it has "contracts for growth" with various mini and peripheral makers — con-

tracts that have totaled about \$10 million a year for the past three years, Pelissolo disclosed.

Most of that \$10 million has gone to Logibax Informatique, S.A., and Societe Europeenne de Mini Informatique et de Systemes, the country's two largest mini makers; Benson, a specialty computer growth company; Intertechnique; Sagem; and Pyral.

In addition, the government

plans to spend close to \$30 million annually until 1983 to develop a domestic components industry covering the full range of component products. This activity began last year. To date, five joint ventures between French firms and foreign companies to develop integrated circuit (IC) products have been started.

A large part of the eventual IC production is slated for export, Pelissolo said, adding

that the St. Gobain/National Semi venture expects to export 40% of its goods by 1983. To support its fledgling industry, France now levies a 15% duty on components vs. a 6% tariff on entire systems imported into the country.

In addition, exports are a very high government priority. For the first time last year, "we succeeded in balancing exports of computer products with imports," Pelissolo said. Approximately \$1.25 billion in French computer goods were both exported and imported last year. The total French industry revenue, including software and services, was about \$5 billion last year. To foster exports, the government sponsors an insurance system that protects the price of goods for the time between the signing of the contract and the delivery of the equipment.

Creation of Jobs

All told, the French computer industry, which already employs about 72,000 workers, created another 4,000 jobs last year. This is particularly important for the French economy, which has a 6% to 7% unemployment rate among its 54 million citizens, Pelissolo said.

DP-related employment in France totals about 250,000 workers, including approximately 100,000 data entry workers, Pelissolo said. Comparing the U.S. and French industry, Pelissolo noted that, unlike France, the U.S. has an atmosphere that fertilizes the growth of small, innovative companies that venture capitalists and banks are willing to finance. "One of the biggest problems is capital formation. Our stock exchange is not active, there are not many venture capitalists and our income tax is 50% across the board on all profits," he complained.

Raised Consciousness

In addition to supporting the industry financially, the government wants to raise the consciousness of the general populace where the DP industry is concerned. "It is necessary to improve our system of teaching people to be favorable to the advanced technology sector. Teaching computer languages is just as important as teaching other languages and mathematics," Pelissolo stressed.

To accomplish this long-term strategy, the government recently committed more than \$500 million to the development of new DP applications — and the automation of businesses — over the next four years. More important, a large part of those funds is aimed at introducing DP into the curricula of high schools and universities.



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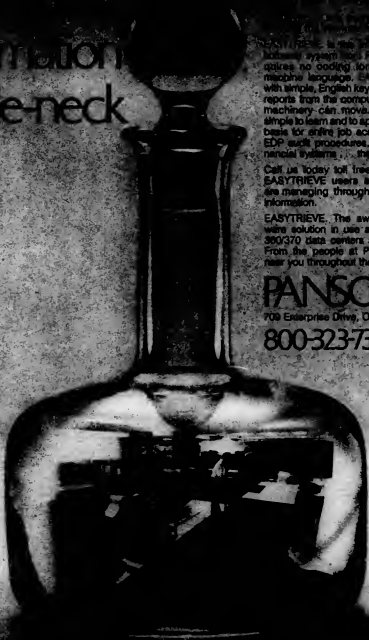
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Two French Shows Spotlight Micrographics

PARIS — "Micrographics in Everyday Life" was the theme of the 11th International Micrographics Congress (IMC), held here late last month.

More than 106 speakers from 21 different countries participated in the conference, which was expected to draw more than 1,000 visitors to 25 sessions and various exhibits.

While many companies exhibited products at the conference site at the Palais des Congrès, a special display area devoted to micrographics was featured at the Salon International de l'Informatique de la Communication et de l'Organisation du Bureau (Sicob), France's largest DP and office equipment trade show.

In all, seven firms exhibited their latest computer output microfilm equipment (COM) at Sicob. However, Data-Graphic, Inc., the industry leader, was missing from the troupe of exhibitors.

Although it has already introduced its 715 COM system in the U.S., JM Co. debuted the product for the French market at Sicob. The firm is discontinuing sales of the 700 system in France and replacing it with the 715, which features both wet and dry film

processing.

In France, the market for COM has been sluggish, growing at about only 15% annually, compared with a 25% or better annual growth rate in other parts of the world, according to industry sources. A total of 14 COM systems are installed in France, with about 40 placements forecast for this year.

While JM's worldwide COM activities are not yet profitable, D.W. (Scotty) McArthur said micrographics represents about 22% of JM's Business Products Division's sales, with COM the fastest growing segment within that product line.

McArthur, one of the founders of the IMC in 1963, predicted cost reductions for COM systems as microprocessor technology begins to replace minicomputers in on-line systems. He noted that JM plans to introduce a micro-based on-line system in the very near future.

However, off-line COM systems will probably remain expensive, he added, because the peripherals used in these systems are not experiencing price reductions.

Despite the cost efficiencies of COM, user resistance is

created by the amount of time it takes a user to get to the image. However, McArthur foresees the replacement of some microfiche readers by CRTs within the next couple of years.

Today, Citibank in New York has a system that allows tellers to view signatures stored on microfiche on a CRT installed at the teller station, he observed.

The IMC show itself seemed to demonstrate a split among vendors — some espousing a set technology and others committed to chemical processing.

Eastman Kodak Co. is committed to laser COM systems. A laser-based COM system can be installed within a firm's computer area because it offers a thermal rather than a chemical process, Alain Joffin, director of DP and office systems for Kodak-Pathe, remarked.

Kodak-Pathe has 22 COM units installed in France, primarily in the distribution and transportation industries. A COM system becomes economical to the user when paper output hits 100,000 pages a month, Joffin said, adding that such a system can replace two to three large printers.

Memorex Media Group Reorganized for the '80s

SANTA CLARA, Calif. — Memorex Corp.'s Consumer and Business Media Group has been renamed and reorganized to put a stronger emphasis on computer products in the 1980s, Group President Theodore J. Cutler said.

The unit is now called the Consumer Products Group. Three executives have been appointed to fill new vice-presidential seats in the group, a fourth was named to direct European operations.

The group's Word Processing Division has been transferred to Memorex's Com-

puter Media Group. Named to the vice-presidential posts were:

- Howard F. Earhart (operations), who will handle research and development of audio and video products for the international market. He will also direct industrial relations and operations control functions within the group.

- Harry G. Hensman (engineering), who will develop technical processes and select new plant sites for the group.

- John R. Humphreys (consumer sales), who will direct consumer sales of audio and video products in the U.S.

- Barry Berghorn, who was appointed VP for the European market.

Racal-Vadic Inks Pact With TI

SUNNYVALE, Calif. — Texas Instruments, Inc. recently reached an agreement with Racal-Vadic, Inc. here in which Racal-Vadic will supply TI with 1,200 bit/sec full-duplex modems for TI's Silent 700 series of terminals.

The modems will be built into TI's Silent 700 and 780 series Model 785 and 787 terminals.

The Model 785 will provide 1,200 bit/sec full-duplex services compatible with Racal-Vadic's VA 3400 products.



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But these two new terminals from ADDS offer more than visual sophistication. Each provides a 14-key numeric pad to streamline data entry. Also 8 function keys, 5 cursor control keys, and an auxiliary port control key. And both have a 25th line—a "status line" that lets the user see the state of the terminal.

Regent 60 offers the further advantage of buffered transmission and additional editing capability.

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DG Expands North American Distributor Net

WESTBORO, Mass. — Data General Corp. has expanded its North American distributor network with the addition of Kierulff Electronics in Anaheim, Calif., and Almac/Stroom Electronics, based in Seattle, Wash. These distributors will stock DG's line of Micronova microcomputer and peripheral products and sell them to the OEM market.

Like other DG distributors, Kierulff and Almac/Stroom will carry chip-level, 16-bit board-level and box-level products as well as packaged systems and peripherals including disk and tape drives and Dasher CRT terminals and printers.

Through the system level, products will be available off the shelf and marketed via hands-on demonstrations and local assistance, according to Peter J. Boni, DG's North American distribution manager.

Distributors give us an extra pair of arms and legs in certain industry and customer segments that our direct sales force does not see," Boni said, citing as examples the instrumentation and process control markets and customers like the small, start-up OEMs that buy in small quantities.

Another obvious benefit of the distribution marketing channel, Boni added, is the ability to provide immediate delivery of Micronova products, the direct sales force usually can't deliver until 60 to 90 days after receipt of order.

In addition, distributors can offer more lenient credit terms than the manufacturer can.

Boni pointed out. All products sold by the distributors carry a DG warranty, and for maintenance requirements, customers "will have access" to DG's service organization, he added.

Almac/Stroom and Kierulff join DG's existing North American industrial distributor network, which includes Schweber Electronics, Hall-Mark Electronics and two Canadian distributors — Future

Electronics, covering the Quebec and Ontario provinces, and RAE for British Columbia.

While coverage among DG's U.S. distributors overlaps in some areas, Boni emphasized the network is complementary, not competitive. For example, Schweber provides the greatest eastern penetration; Hall-Mark offers the largest southern and mid-western coverage; Kierulff has the

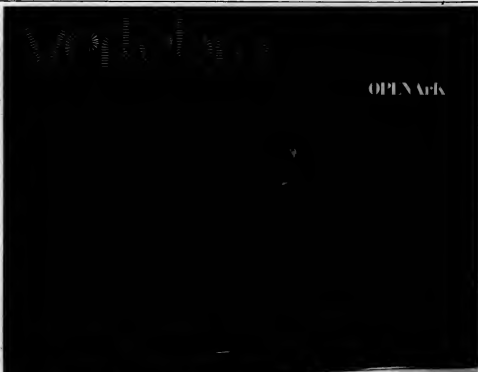
largest western base; and Almac/Stroom, a regional distributor, concentrates on the Pacific Northwest.

Calling the distributor network "an extension of DG's field marketing force," Boni explained, "Our salesmen receive commission credit for what each distributor sells in their assigned piece of geography."

For Almac/Stroom, the agreement with DG marks the

first time it has stocked and sold "low-end minicomputer products and systems in-house," remarked Fred Warrick, the distributor's president.

The Seattle-based firm will continue its traditional business of carrying board-level microcomputers supplied by such vendors as Intel Corp., Texas Instruments, Inc., Motorola Corp. and National Semiconductor Corp.



Supershorts

Fairchild Semiconductor granted distribution rights in northern California for its component products to Intermark Electronics. Intermark had acquired the Fairchild line at its Santa Ana and San Diego locations in southern California last year.

Xerox Corp. has acquired exclusive rights to market and manufacture Mathematical Applications Group, Inc.'s (Magi) computer-based slide machine terminals, used to produce 35mm business slides. The agreement calls for Magi to sell this and related equipment to Xerox, which will pay Magi a royalty on revenues received from its use of the slide-machine software. Magi received \$250,000 in advance royalties and will receive an additional \$250,000, subject to certain conditions, during the fiscal year ending March 31, 1980.

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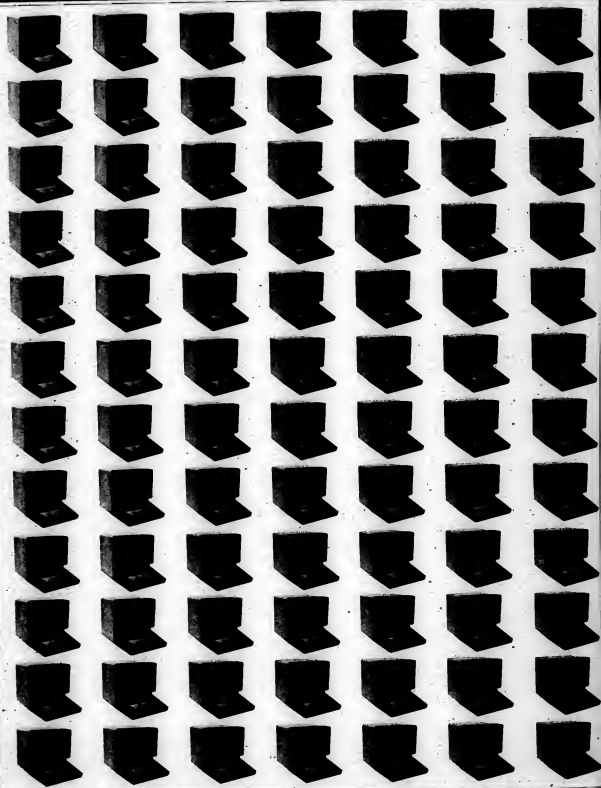
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Blend of Technologies Encouraged for Systems

PARIS — In building an information management system today, most progressive companies are finding that a blend of technologies and hardware is better than rigid adherence to any one discipline, according to a speaker at a session of the 11th International Micrographics Congress, held here last month.

In discussing this blending of technologies, W.D. Robinson, director of sales development for information technology products at Eastman Kodak Co.'s International Photographic Division, recalled the time during the early 1960s when futurists touted computer output microfilm (COM) as the quick cure for storage problems.

But COM growth during the early 1970s was disappointing as companies

turned to an "all-electronics storage approach," Robinson noted. During the late 1970s, however, COM has flourished.

The micrographics industry is growing at an annual rate of 20% to 25% and COM is growing even faster than that, he remarked. Today companies are finding that an all-electronics approach is not necessarily the most efficient.

A case in point is Citibank in New York City. That bank took a new look at microfilm when it found a complicated computer system proposed by a project leader turned out to be the "world's most expensive microfilm camera."

That perception was gained by Citibank's executive vice-president,

Robert White, after listening to the project leader's description of the system. White's perception created a precedent for using a practical microfilm solution to overcome the weakness in an otherwise potent electronics system, Robinson noted.

A direct access storage device with 300M bytes of storage would have cost the bank \$40,000 and required \$300 of direct access storage for 3,000 letter-size documents. Microfilm storage would have stored eight times the amount of information of the \$10, Robinson claimed.

Going the other way, from microfilm to COM, was Carbones Armor, a large French producer of carbon products. The firm had stored customer records on microfilm for years. When it in-

stalled a computer system, it had a great deal of difficulty handling paper output.

Building on its experience of using microfilm storage, Carbones Armor contracted with a local service bureau to provide computer-generated microfiche copies of sales documents, financial reports and catalogs to different departments.

The company's management estimated that data recorded on microfiche consumed 500 to 1,000 times less volume than paper output, Robinson noted.

Practicing what it preaches, Kodak, too, has gained storage economies by outputting 80% of all its computer information on microfilm rather than paper, Robinson noted.



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Whether you're presently involved with data communications or just looking, our November 26 Special Report will be of special interest to you. And if you market data communications products or services—this is a good place to get the word out. Ad closing is November 9 and your Computerworld representative can give you all the details. Or, to reserve space, call Frank Collins at (617) 965-5800.



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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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San Francisco
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Los Angeles
Jim Richardson
Bob Hubbard
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(213) 450-7181

Contracts

Cray Research, Inc. has been awarded a contract by the University of California under a university contract with the U.S. Department of Energy for a Cray-1 computer system valued at approximately \$10 million. The system will be leased.

RCA American Communications, Inc., has been awarded a National Aeronautics and Space Administration contract, amounting to \$130,000 monthly for a dedicated in-house service in support of various activities including the Space Shuttle, Spacelab and Landsat D programs.

Digital Communications Corp. has received a \$5.7 million contract from GTE Telenet for digital communications processing equipment.

The Peritek Computer Corp. Peripheral Division has been awarded a two-year contract by Microcomputer Tech. Inc. for FD200 single-head, double-density flexible disk drives and FD250 dual-head, double-density flexible disk drives.

Burroughs Corp. has licensed Integrated Software Systems Corp.'s Displa computer graphics software system.

Recognition Business Systems, Inc., has received a contract for the purchase of six automated commercial mail processing systems from the U.S. Postal Service.

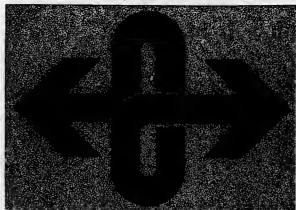
Diebold, Inc. has received a contract to supply the Bank of America with 30 to 40 Diebold Tabs 9000 automatic teller machines.

Planning Research Corp. has received a \$6.3 million, three-year contract from the Rome (N.Y.) Air Development Center to continue developing the Advanced Imagery Requirements Exploitation System for the Defense Intelligence Agency.

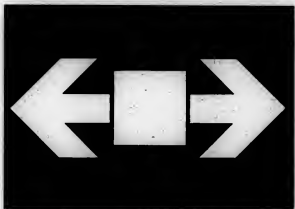
Interactive Sciences Corp. has been awarded a six-year contract by the Federal Election Commission to supply the commission with DP services supporting the Federal Campaign Financing Compliance and Reporting Systems. The contract's estimated value is \$3.5 million.

Infotronics Systems Corp. has received a \$500,000 contract for Supermux 780 statistical multiplexers from Computer Sciences Corp.

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IDCMA Urges Greater Control of AT&T

WASHINGTON, D.C. — The Independent Data Communications Manufacturers Association (IDCMA) submitted its comments to the Federal Communications Commission's (FCC) Second Computer Inquiry recently.

The IDCMA remarks stressed the continuing need for organizational and other restraints for carriers that control underlying transmission facilities and have vertically integrated manufacturing affiliates. IDCMA noted these safeguards are not only essential to prevent cost subsidization but are also necessary when addressing the problem of tying.

Tying involves the ability of underlying carriers to manipulate the availability and quality of the transmission services in order to further the carriers

control of the competitive market. For example, the underlying carrier might elect to provide new service or repair service to the users of its competitive services faster than it would provide the services to users of a competitor's equipment.

To guard against such abuses, IDCMA urged the commission to impose stringent organizational restraints on the way monopoly carriers are permitted to offer competitive services and equipment. It suggested that there be complete separation between manufacturing, marketing and services for equipment and services offered as part of the carrier's monopoly business and those that are offered in the competitive sector.

Accounting procedures are totally in-

adequate to ensure competition for telecommunications equipment and services, IDCMA stated. In addition, the competitive activities of the monopoly carrier that owns underlying facilities should be subject to continuing FCC regulation until it is clear that structural separation is working, the IDCMA urged.

With AT&T's history of anticompetitive behavior and the overwhelming evidence of the probable continuation of such activity, any relaxation or modification of the 1956 consent decree, unless such modification would make the decree more rigid, is totally unwarranted and would be a disservice to the public, the organization said.

IDCMA concluded that the telecommunications industry, unlike any

other industry in the U.S., is completely dominated by one carrier. Therefore, to allow that carrier to expand its activities into other areas of telecommunications or data processing without adversely affecting competition. The history of innovation in data communications and data processing has shown that there is clearly no need for AT&T to participate in that market, the IDCMA said.

Magazine Set On Fiber Optics, Communications

BROOKLINE, Mass. — A trade publication providing information on the application of fiber optics to communications and related industries is in the works at Information Gatekeepers, Inc.

Called *International Fiber Optics and Communications*, the magazine will be published bimonthly starting in January 1980. A seventh issue will be in the form of a *Fiber Optics Handbook and Market Guide*.

Initial circulation will be 20,000 domestically and 4,000 internationally. Paul O'Neill, former assistant editor of "Telecommunications" and present editor of "Inteltrade," has been named editor of "IFOC."

Information Gatekeepers is located at Suite 111, 167 Corey Road, Brookline, Mass. 02140.

Revenue at \$8 Million For On-Line Systems

PITTSBURGH, Pa. — On-Line Systems, Inc. reported revenues of \$8.2 million for its first quarter ended July 31, compared with revenues of \$6.8 in the comparable quarter a year ago.

Earnings for the quarter were \$572,916 or 41 cents per share, compared with \$475,605 or 35 cents per share a year earlier.

In July, United Telecommunications, Inc. signed a definitive agreement with On-Line Systems for the acquisition of the latter. Stockholders will vote on the move at a special Oct. 19 meeting.

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NCC COMPUTERWORLD

In addition, all the people who submit winning entries (including all duplicate entries) will be thrown into a hat (or at least their entries will) and six lucky winners will be drawn more or less at random (we never said the judges were fair). These six lucky souls will receive a free, hand-held computer game valued at well under \$100 if we can do it.

You may not enter as many times as you like because we know you have computers and can run off huge numbers of entries which will drive us crazy.

So only two entries are permitted per person and all entries must be received on the official order form or a copy thereof. All decisions of the judges are considered final, and no representation as to their competence, skill or fairness are being made. Deadline for entries is November 15th 1979 in our offices in Newton.

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Every year, as all you button freaks know, Computerworld distributes tens of thousands of buttons (at no cost, we like to point that out) at NCC, the Computer Expos and other trade shows across the country. A whole generation of computer people have come to look for these buttons, and they have become a tradition in the industry.

This year, we're going to give you a chance to participate in the tradition. We're looking for good button suggestions — funny, relevant and at least moderately clean—for consideration by our experienced panel of judges. (Examples of buttons we've used are shown.) As many as six suggestions

will be chosen by our judges (based on criteria known only to them), and if your entry is among those picked, you will receive a certificate of appreciation suitable for showing off to your friends.

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in
gospel
out.**

NCC COMPUTERWORLD

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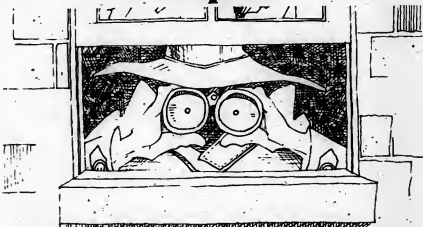
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Prefer five years experience in automated financial systems, on-line and education systems experience a major consideration. Salary commensurate with experience. Equal-opportunity employer.

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Requires experience in O.S. or DOS, IBM RPG II and Cobol Bachelor's degree with 2-5 years programming experience required. Two years systems analyst experience preferred. Oil and Gas background helpful.

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Programmer/analyst background, coupled with competent financial understanding necessary. Experience in IBM RPG II and Cobol required. Report Preparation-Technical Writing ability and verbal communicative skills a must. Planning and scheduling experience preferred. Oil and Gas background helpful.

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Positions Available in Arizona and New Mexico. These Persons Should Possess One or More of the Following Qualifications:

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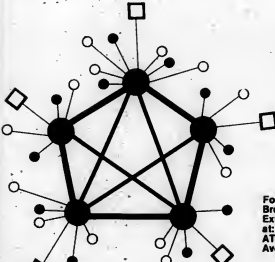
SYSTEM ENGINEERS will participate in the specification of system architecture and translation of requirements into software specifications.

Considerations include data transmission, network maintenance and management, centralized billing and improved customer service. You will also participate on task teams with other GTE organizations to develop requirements and specifications, and to prepare design and implementation plans. Qualifications should include in-depth experience in communications system engineering. Telephony background is desirable. BS/MS in Engineering or Computer Science.

SOFTWARE ENGINEERS will be responsible for analysis, specification, design, development, test and maintenance of software involving man-machine interaction, communications processors, data base management, billing, switch maintenance and traffic data analysis. Requirements include several years experience in real-time software system development; assembly, PL-1, PASCAL, RSX-11 programming capabilities and BS/MS in Engineering or Computer Science. Experience in telephony, simulation, process control or related applications is desirable.

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Experienced System Design Manager to be responsible for the software development of our new intelligent data storage product. In addition to a BSE Degree, the successful candidate will have ten years of system design/programming, and the successful development of one product to delivery. Experience in state-of-the-art documentation and development techniques highly desirable. This project will require the development of detailed documentation to support the product development effort.

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Position requires an experienced person to be responsible for the definition, design and development of software for an intelligent data storage product. The successful candidate will have an in-depth knowledge of the software, or equivalent, and will have had direct technical responsibility for the completion of several software products that would have included software that controls hardware.

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An experienced Software Management person required to develop the software support function for our new intelligent data storage product. You will be responsible for system test planning, manufacturing support planning, program management and customer support. A BS in Engineering, or equivalent, and several years of software development and software support experience required. The successful candidate will also have authored or managed the development of compilers/assemblers.

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TOLL FREE 800-525-2946, EXT. 5317

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Computer Systems

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These positions are located in the Large Eastern Research Laboratory. The successful candidate for computer support directly responsible for test activities of the Department. The Group is located in downtown Boston, MA. The successful candidate will be interviewed by March, 1980.

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DATA PROCESSING

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Loren Olson
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Cleveland Clinic
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The Cray Operating System Test/Integration Group has openings for a Programmer/Analyst. Duties include operating system testing, integration and test development and may include some utility program of the operating system and can lead to later specialization in operating system development. A Bachelor's degree in Computer Science, programming or system testing is desirable.

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Sperry Univac's Airline Industry Development Center, located in suburban Minneapolis, is an international leader in the design and support of software applications such as reservations, ticketing, cargo, departure control, message switching, check-in, hotel and later queries. We're looking for candidates with a desire and ability to interact with key domestic and international airlines EDP personnel and with experience in any one of the following areas:

- Design, implementation and support of real-time applications
- Quality assurance of application programs
- Technical support in the customer environment
- Support of OS 1100/TP/CMS/DMS
- Data Base administration

Experience with Fortran or UNIVAC 1100 series is desirable.

We offer highly competitive starting salaries commensurate with your background, plus a comprehensive fringe benefits program and excellent opportunities for personal satisfaction and professional growth.

FOR IMMEDIATE CONSIDERATION, PLEASE CALL COLLECT OR DIRECT YOUR RESUME TO:

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St. Paul, Minnesota 55166
(612) 456-2309

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SPERRY UNIVAC
COMPUTER SYSTEMS

PROGRAMMING PROFESSIONALS ONLY

Are you ready to take the next step in advancing your career? Hyster Company can provide that step.

We have a challenging growth opportunity for a seasoned programmer to take on the duties of a PROGRAMMING PROJECT LEADER directing a 4 to 8 person team. The successful candidate will have significant programming experience in COBOL or PL/I in an on line environment using structured programming techniques. Position responsibilities include maintenance and new program design.

Hyster Company is an internationally recognized manufacturer of forklift trucks and is running in a 370/5V5 environment using TSO and Panvaet.

Located in pleasant Danville, Illinois we provide a first-rate benefit and compensation package and a first-rate opportunity.

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Software Professionals: Tap The Creativity In You

Here's your chance to make significant contributions to future generations of products of Digital Equipment Corporation, and get the satisfaction and reward of seeing your ideas put to work.

Right now, our Small Systems Software Development Group is looking for talented individuals at all levels of experience to join them. As part of this group, you'll work on quality products in an innovative team environment, and be involved in exciting and challenging projects as you pave the way to the software development of the '80s.

If you'd like to work in the kind of professional environment that only a world leader can offer, come to Digital. And exercise your creativity.

In addition to the following positions, we are also seeking individuals with experience, or an interest in: intelligent terminal software, small applications systems, small operating systems, human engineering of software computer systems, software implications of LSI, software development project management, program management, and product management.

Software Development

We need individuals at all levels of experience to get involved in the design of an interactive applications generator for our small systems. This revolutionary system will conduct a dialogue with a small operator to determine the database needs of the application, and integrate them with a routine system involving user defined forms to access the database. A solid background in systems design and database work is a must. Experience with applications and interactive systems would be a plus.

Supervisory opportunities also exist in small systems software development. A strong Software Engineering Supervisor is needed for a group developing software tools for microprocessor based application development. Management of exciting projects to provide an implementation language and sub-monitor software components are part of the challenge of these positions.

Graphics Development

An exciting opportunity currently exists for a Senior Software Engineer to work with a wide audience and assume project responsibility for graphics packages for low-cost office applications in graphics-style editors and for end-user education and commercial applications. Two to three years of experience in systems development, preferably in graphics is essential. Experience with RT-11 or RSX-11 applications, as well as a knowledge of BLISS and/or MACRO-11, are required.

If you are interested in, and qualified for, any of these outstanding positions, please forward your resume, complete with salary history and expectations, to Chris Larkin, Digital Equipment Corporation, Dept. B10163180, 146 Main Street, Maynard, Massachusetts 01754, or call COLLECT 617/455-9067. We are an equal opportunity employer m/f.

Software Documentation

Positions are available at both our Maynard and Tewksbury facilities for several documentation specialists to support our new and existing software development projects. Ideally, we seek Software Writers with experience in one or more of the following areas: terminal software, graphics software, operating systems, development languages. Two or more years of experience producing user documentation is required. A BA/BS degree would be preferred.

digital

data processing

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As a seasoned professional in the DP community, you've had the chance to seek and conquer new technical challenges. At this point you may be seeking the unique opportunity to leave the office and join our Field Support Group. You would enjoy the full range of on-site responsibilities and the recognition and rewards of contributing to our mutual success in an individual manner.

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Your maintenance-oriented background includes experience with MVS, VM, JES2, JES3, or IMS internals, and the ability to read dumps and write code to resolve system problems. You will be the Amdahl interface to 470V system customers in all software related functions.

For Midwest locations call Phil Beckhlem collect at 301/657-8200. For East and Southeast locations call 312/655-5716.

For West and Southwest locations call Pat Ramirez toll free at 800/538-8460 ext. 6166 or send your resume in confidence to Employment Department, Amdahl Corporation, P.O. Box 370, Sunnyvale, CA 94086. We are an equal opportunity employer m/f/h.

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SENIOR SYSTEM ANALYST

Several openings exist for Senior Systems Analysts. Successful candidates will act as project leaders in the design of data base systems in the materials management and financial information areas. Degreeed candidates with three to five years experience as a project leader and working familiarity with CICS and DB1 are encouraged to respond.

An excellent salary and benefits package is available, commensurate with experience and education. Also, Heumrich, Inc. is located in Western Michigan where outdoor activities abound. Education facilities and travel opportunities are excellent. Grand Rapids, a major cultural center, is only minutes away.

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- 3) **IMS; TOTAL; IDMS**
- 4) **Willing to travel extensively**

The company pays all fees, including interviewing and relocation, additionally, they offer excellent benefits, in-house career opportunities, and salaries in the \$14-26K range. Please call me collect (904) 398-7371 if you are interested in this excellent opportunity.

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definition

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This unique department provides early definition and systems design of future NCR communications products along with initiation, and startup development of new programs. The group is characterized by working in a state-of-the-art software/hardware environment, with opportunities for individual contributions in a systems level scope of design from the conceptual stage to the finished product.

We are currently seeking individuals with a minimum of 5 years experience in software and/or hardware who desire work and have experience in one of the following areas:

- Microprocessor Based Hardware or Software Systems
- Processing Systems
- Operating Systems, High Level Languages and File or Data Management
- Firmware Design
- Communications Products Design and Definition
- Systems Modeling

All our positions are in our beautiful, sunny South Carolina location, close to the seashores and

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If you are seeking a challenging career with a leader in the industry, need a new lifestyle and have the above experience, we'd like to speak with you.

A degree in Engineering, Math or Computer Science is required. For consideration, please send your resume and salary requirements in complete confidence to: Bob Race, Dept. J80, Industrial Relations, Communications Systems Division, NCR Corporation, 3325 Platt Springs Road, West Columbia, S.C. 29168.

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Your Experience in Computing could lead to a rewarding career in sales support at Tektronix!

Our continual expansion allows us to offer an exciting career position to a talented Systems Analyst with proven experience in sales support or a strong desire to become actively involved in the sales environment.

You will work in support of our sales engineering group in our entire Eastern Region. Your duties will include: providing technical assistance to customers, computer graphics consultation, and customer training in hardware/software and applications. In addition to technical knowledge, you should possess excellent written and verbal communication skills. Your background should include experience in using timesharing systems, data communications and FORTRAN programming. A college degree is preferred.

We can offer you an excellent salary, complete benefits, and outstanding advancement potential with a strong, growing company.

For confidential consideration please contact Mr. Jack Dnoch at TEKTRONIX, INC., 2 Research Court, Rockville, Maryland 20850, or call TOLL FREE at (800) 638-4062.

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World leading forest products and Fortune 500 company has immediate openings for persons with 2-6 years' experience in large scale operating system, on-line database or graphics software support, preferably with Honeywell Large (Level 60) Systems.

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Seeking mature, self-guiding individuals capable of proposal definition, software selection and project leading.

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We are seeking professionals who are self-starters looking for a stimulating work environment where achievement is recognized. We have immediate openings for qualified professionals with experience in one or more of the following fields:

- SOFTWARE ARCHITECTURE DEFINITION
- REAL-TIME MULTI-TASKING EXECUTIVES
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- COMPUTER NETWORKS
- INTERACTIVE HUMAN INTERFACES
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You will develop software using structured techniques for state-of-the-art sixteen bit microcomputers in office systems incorporating advanced data management and distributed processing concepts.

System Development Corporation offers an excellent environment for professional growth. Our salaries are competitive and our benefits are among the best in the industry, including 4-weeks paid vacation the first year.

For immediate consideration, please send your resume or call:

Nancy Phillips
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System Development Corporation

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COMPUTER SCIENCE ART/ABOC PROFESSOR

MARSHALL UNIVERSITY, a West Virginia state university, has a new, newly growing, Computer Science Department which needs teaching staff members. The present need is for undergraduate teachers. A graduate program being considered for the future. A PhD or equivalent is desired. Individuals with experience in computer science but not required. First deadline is November 15, 1979 with extension. If a qualified person is not found by that time, salary is competitive and based upon education and experience.

Send all resumes and inquiries to:
Charles H. Doolittle, Chairman
Computer Science Department
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Progressive firm, sev. yrs. exp. seeks top CICS apps. heavy to design & implement new apps. IBM 3031 MVS environ. Hi-viability pos. Supv. skill staff. Salary \$25,000. Fee Paid. Contact Gary Sattles.

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Manager Systems and Programming

Immediate Salary/Profit System, recognized as leading in the field in major centers in the nation, operates the Transportation unit of FUDUA Industrial, Inc., a multi-plant manufacturing and service company.

An outstanding career opportunity exists for the project leader who is ready to assume full responsibility for the department or, the programming manager who desires a new challenge. You must be a leader who has a proven track record in project management experience and superior business management skills that distinguish you from the data processing technician.

The position requires a minimum of three years of project management experience and primary responsibility for the design of sophisticated systems in a large field installation. Broad experience in the development and design of new computer systems with primary emphasis in the development and design of new computer systems with primary emphasis in the development and design of new computer systems with primary emphasis in the development and design of new computer systems.

Qualified candidates will be required to possess strong verbal and written communications skills, have above-average ability to solve problems at the executive and chief level and be able to present alternative courses of action to staff and top-management levels.

If you are interested in a challenging and rewarding career opportunity, please call first 408-628-1, ext. 345, or send resume including salary requirements to:

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In Reply, Please Refer to #1



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Software Development Engineers

New technology brings new challenges at Cordis Dow.
... In the land of rolling hills and Redwoods.

Cordis Dow Corp., has established itself as a technological and business leader in Northern California through the development, manufacturing and marketing of artificial kidneys and other medical devices. And our recent growth has created openings at our Concord, California site for Software Development Engineers who want to apply their skills creatively while working with exciting new developments in medical device technology.

Positions require a BSCE or BSCE add 3 to 5 years experience in microcomputer programming. Should be familiar with ROM and MDS systems, have a knowledge of PLM and the ability to generate clever, compact algorithms for use in controller product development. In addition, should possess knowledge of hardware constraints and interface requirements.

We'll provide a competitive salary, excellent company-paid benefits, and relocation allowances. Our facility-located 25 miles from San Francisco — is a short drive from the coast, and only a 2 hour drive from resorts offering skiing, hiking, camping and other outdoor attractions. Fresh water and salt water fishing, and numerous State Parks are also within easy driving distance.

If you want to utilize your abilities and skills to the fullest, and share in our success, send resume and salary requirements in strict confidence to: Professional Employment, Dept. CWT, Cordis Dow Corp., 3480 Blue Lane, Concord, CA 94520.

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The two opportunities below are prime examples of how you can combine your "star" technical skills and strong personal presentation with career viability and mobility.

AUTOMATION TECHNOLOGY CONSULTANT

Investment banking firm seeks a Pro who can use new technology to solve business problems. Will use large scale & mini hardware, software & application expertise to evaluate implement solutions. Broad technical background, good communications skills and ability to interface at all levels are a must. Compensation includes substantial cash bonus.

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Financial organization needs candidates with mini or on-line background who feel at home in both the business and technical worlds. Manage new development projects and consult with users. 3 weeks vacation.

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Responsible for software development and human interface activities covering a multiple facility Computer Aided Design program. A high visibility situation with exceptional potential in an advanced technology Fortune 500 company. Requirements include: a minimum of BS degree in Engineering, preferably Mechanical; engineering design experience, 2 or more years of experience with large microcomputer based operating systems; and a minimum of 1 year programming in FORTRAN.

Qualified candidates are invited to mail their resumes to: Guy Beach, 1160 Summer Street, Stamford, CT 06908 ... or phone (203) 387-9111 collect.

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We're looking for a solid background (3 years +) in word processing applications. Expertise in assembly language programming, utilizing minicomputers and microcomputers. BSEE.

Business Applications

We're looking for solid background (3 years +) in business applications utilizing high level language on minicomputers or microcomputers. BSEE.

Interested in joining the winning team at Docuprint? Send your resume with salary history to: Docuprint, P.O. Box 2400, Dept. 107, Melbourne, Florida 32901.

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SOUTHEASTERN AND MID-ATLANTIC LOCATIONS

Growth of our Management Advisory Services practice creates challenging career opportunities for professionals with private and public sector management and specialized industry experience. High level consulting opportunities available in:

- MIS strategic planning
- Requirements evaluation studies
- Design and implementation of large scale, interactive business systems
- Data processing effectiveness, security, and control reviews
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- Minicomputer/distributed information processing evaluation studies and implementation project management

Successful candidates will have about five years experience and a record of accomplishment in consulting or in the financial institution, manufacturing, transportation, petroleum, utility, chemical, retail, professional service, or government sectors. Advanced degree is desirable. Excellent technical, communication, and entrepreneurial skills required.

Please send resume, or telephone if you prefer, in complete confidence.

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MIS PROFESSIONALS

IBM 370 DOS VSE, ICCF, DL 1, VSAM

To meet the dramatically growing needs of BMW of North America, Inc., we are installing new IBM computer systems, expanding our staff of systems professionals and developing new corporate application systems. If you are a professional with qualifications we need, you can play a vital role in the design and implementation of these systems. These positions are located in our Corporate Headquarters in Montvale, N.J.

PROGRAMMER ANALYSTS

Positions require at least 1-2 years' experience in analysis, design and specification of systems, in addition to 2+ years' experience as a Senior Programmer utilizing COBOL, DL/I and CICS.

SOFTWARE ANALYST

Will be responsible for implementing and maintaining system software, vendor ESDS, etc. Requires at least 1-2 years' DOS/VS, CICS/ETAS, DL/I, VSAM, TP experience. 2+ years' overall software experience desirable.

Salaries commensurate with experience plus excellent company paid benefits program. Qualified applicants are invited to submit detailed resumes and references, outlining experience, salary history and requirements, to: Personnel Manager



BMW OF NORTH AMERICA, INC.

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SYSTEMS SOFTWARE & APPLICATIONS MANAGER

Howorth, Inc., a leading innovator in the manufacture of office interior systems, is seeking a customer motivated, results oriented individual who possesses excellent human relations skills, three to five years project management experience, and a conceptual knowledge of data base design. Successful candidate will be degreed (Masters preferred) with an MSF background. Environment will be a 370-138 using COPIC, VSI, CICS, and DL1.

An excellent salary and benefits package is available, commensurate with experience and education. Also, Howorth, Inc. is located in Western Michigan where outdoor activities abound. Education facilities and travel opportunities are excellent. Grand Rapids, a major cultural center, is only minutes away.

Qualified applicants looking for a challenging and rewarding opportunity may respond by mailing a current resume and salary history to:

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PROGRAMMERS**ANALYSTS****IMMEDIATE OPENINGS AT UNITED AIRLINES**

Denver Computer Center

Minimum Requirements:

- 2 years programmer experience
- 1 year ALG/BAL experience
- 300/370 equipment

Excellent benefits including unlimited free and reduced transportation to accepted applicants.

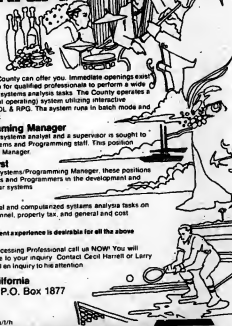
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Systems and Programming Manager

An individual skilled as both a systems analyst and a supervisor is sought to direct the activities of the Systems and Programming staff. This position reports to the Data Processing Manager.

Senior Systems Analyst

Under the supervision of the Systems/Programming Manager, these positions lead teams of Systems Analysts and Programmers in the development and maintenance of major computer systems.

Systems Analyst

Performs a full range of manual and computerized systems analysis tasks on such systems as payroll/personnel, property tax, and general and cost accounting.

On-line applications development experience is desirable for all the above positions.

If you are a qualified Data Processing Professional call us NOW! You will receive an immediate response to your inquiry. Contact Carol Harrell or Larry Butler at (408) 424-8811 or send an inquiry to the attention:

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The manufacturing systems group is responsible for providing data processing support to our central IBM 370-138 OS/VS system by remote job entry terminals. We are currently in the process of implementing this by a network of distributed Hewlett-Packard 3000.

The successful candidate for this position will initially be responsible for the design, programming and implementation of batch-oriented computer systems. Both user contact and limited travel to plant location will be involved. Future assignments will include on-line applications on the HP 3000 network.

Qualifications should include a Bachelors degree and a minimum of 3 years experience in the design, programming and installation of computer systems. We offer an excellent opportunity for personal and professional growth, accompanied by an excellent salary and benefits package. Send resume including salary to:

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Join Our Team TODAY... You'll Be Glad You Did TOMORROW!

Daniel Construction Company, a world leader in the construction of nuclear power plants, is currently seeking individuals to fill key positions at its CALLAWAY PROJECT located in Fulton, Missouri. These are long-term assignments which offer excellent professional development and career opportunities. Current openings include:

Programmers and Programmer/Analysts

You must have experience in the following areas: IBM/370, VSE, OS/360, COBOL, and MARK IV. In addition, experience with VSAM, DEC Basic Plus or Syrac TAL-II would be helpful.

RJE Terminal Operator/Data Entry Operator

To qualify, you must have both D/SRJE experience and data entry background to supervise evening operations. Syrac 440 experience helpful.

We offer an excellent starting salary, generous relocation allowance, and a program of company paid benefits for employees.

To find out more why you should be a part of our team, call MIT CH RUGG at:

(314) 676-3111

If unable to call, send your resume with salary history, in confidence, to:

Mitch Rugg
Professional Employment
Daniel Construction Company
P.O. Box 108
Fulton, Missouri 65251



An Equal Opportunity Employer M/F

GROUND FLOOR OPPORTUNITIES

The Business Communications Division of International Telephone and Telegraph Corporation, leaders in the development of telephone switching systems, is embarking on a new venture called Product Software Support and several high level positions available for the discerning professional.

PROJECT LEADER Software Production

This department will be responsible for the overall manufacturing of product software and utility software development. The incumbent will be responsible for the establishment of a separate software manufacturing organization.

PROJECT LEADER Software Quality Assurance

This department will be responsible for overall quality assurance of product software. The incumbent will be responsible for establishing separate software quality assurance function and organization.

Due to the weighty nature of these positions the successful candidates will have:

- BS degree in Computer Science, Electrical Engineering, or Industrial Engineering.
- At Least 5 years of software experience
- Systems design background
- Supervisory experience
- Experience in manufacturing, data processing and quality assurance is desirable

If you feel you have the above background and qualifications and you have the desire and ambition to spearhead a new venture, we would like to hear from you. Please send complete resume, including your salary history, to Mr. Ed. B. Walters, ITT Business Communications Division, Department P&S, 2000 South Road, Des Plaines, Illinois 60018.

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PDP-11 COMPATIBLE EQUIPMENT MODEM MEMORY: 1200 baud modem 2400 baud modem 300 baud modem 1200 baud modem 2400 baud modem 300 baud modem DISK DRIVE: 5 1/4" 5.25" 8" 10" 11" 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" POST-11 TAPES: 1/2" 5/8" 3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2" 2 1/4" 2 1/2" 2 3/4" 3" 3 1/4" 3 1/2" 3 3/4" 4" 4 1/4" 4 1/2" 4 3/4" 5" 5 1/4" 5 1/2" 5 3/4" 6" 6 1/4" 6 1/2" 6 3/4" 7" 7 1/4" 7 1/2" 7 3/4" 8" 8 1/4" 8 1/2" 8 3/4" 9" 9 1/4" 9 1/2" 9 3/4" 10" 10 1/4" 10 1/2" 10 3/4" 11" 11 1/4" 11 1/2" 11 3/4" 12" 12 1/4" 12 1/2" 12 3/4" 13" 13 1/4" 13 1/2" 13 3/4" 14" 14 1/4" 14 1/2" 14 3/4" 15" 15 1/4" 15 1/2" 15 3/4" 16" 16 1/4" 16 1/2" 16 3/4" 17" 17 1/4" 17 1/2" 17 3/4" 18" 18 1/4" 18 1/2" 18 3/4" 19" 19 1/4" 19 1/2" 19 3/4" 20" 20 1/4" 20 1/2" 20 3/4" 21" 21 1/4" 21 1/2" 21 3/4" 22" 22 1/4" 22 1/2" 22 3/4" 23" 23 1/4" 23 1/2" 23 3/4" 24" 24 1/4" 24 1/2" 24 3/4" 25" 25 1/4" 25 1/2" 25 3/4" 26" 26 1/4" 26 1/2" 26 3/4" 27" 27 1/4" 27 1/2" 27 3/4" 28" 28 1/4" 28 1/2" 28 3/4" 29" 29 1/4" 29 1/2" 29 3/4" 30" 30 1/4" 30 1/2" 30 3/4" 31" 31 1/4" 31 1/2" 31 3/4" 32" 32 1/4" 32 1/2" 32 3/4" 33" 33 1/4" 33 1/2" 33 3/4" 34" 34 1/4" 34 1/2" 34 3/4" 35" 35 1/4" 35 1/2" 35 3/4" 36" 36 1/4" 36 1/2" 36 3/4" 37" 37 1/4" 37 1/2" 37 3/4" 38" 38 1/4" 38 1/2" 38 3/4" 39" 39 1/4" 39 1/2" 39 3/4" 40" 40 1/4" 40 1/2" 40 3/4" 41" 41 1/4" 41 1/2" 41 3/4" 42" 42 1/4" 42 1/2" 42 3/4" 43" 43 1/4" 43 1/2" 43 3/4" 44" 44 1/4" 44 1/2" 44 3/4" 45" 45 1/4" 45 1/2" 45 3/4" 46" 46 1/4" 46 1/2" 46 3/4" 47" 47 1/4" 47 1/2" 47 3/4" 48" 48 1/4" 48 1/2" 48 3/4" 49" 49 1/4" 49 1/2" 49 3/4" 50" 50 1/4" 50 1/2" 50 3/4" 51" 51 1/4" 51 1/2" 51 3/4" 52" 52 1/4" 52 1/2" 52 3/4" 53" 53 1/4" 53 1/2" 53 3/4" 54" 54 1/4" 54 1/2" 54 3/4" 55" 55 1/4" 55 1/2" 55 3/4" 56" 56 1/4" 56 1/2" 56 3/4" 57" 57 1/4" 57 1/2" 57 3/4" 58" 58 1/4" 58 1/2" 58 3/4" 59" 59 1/4" 59 1/2" 59 3/4" 60" 60 1/4" 60 1/2" 60 3/4" 61" 61 1/4" 61 1/2" 61 3/4" 62" 62 1/4" 62 1/2" 62 3/4" 63" 63 1/4" 63 1/2" 63 3/4" 64" 64 1/4" 64 1/2" 64 3/4" 65" 65 1/4" 65 1/2" 65 3/4" 66" 66 1/4" 66 1/2" 66 3/4" 67" 67 1/4" 67 1/2" 67 3/4" 68" 68 1/4" 68 1/2" 68 3/4" 69" 69 1/4" 69 1/2" 69 3/4" 70" 70 1/4" 70 1/2" 70 3/4" 71" 71 1/4" 71 1/2" 71 3/4" 72" 72 1/4" 72 1/2" 72 3/4" 73" 73 1/4" 73 1/2" 73 3/4" 74" 74 1/4" 74 1/2" 74 3/4" 75" 75 1/4" 75 1/2" 75 3/4" 76" 76 1/4" 76 1/2" 76 3/4" 77" 77 1/4" 77 1/2" 77 3/4" 78" 78 1/4" 78 1/2" 78 3/4" 79" 79 1/4" 79 1/2" 79 3/4" 80" 80 1/4" 80 1/2" 80 3/4" 81" 81 1/4" 81 1/2" 81 3/4" 82" 82 1/4" 82 1/2" 82 3/4" 83" 83 1/4" 83 1/2" 83 3/4" 84" 84 1/4" 84 1/2" 84 3/4" 85" 85 1/4" 85 1/2" 85 3/4" 86" 86 1/4" 86 1/2" 86 3/4" 87" 87 1/4" 87 1/2" 87 3/4" 88" 88 1/4" 88 1/2" 88 3/4" 89" 89 1/4" 89 1/2" 89 3/4" 90" 90 1/4" 90 1/2" 90 3/4" 91" 91 1/4" 91 1/2" 91 3/4" 92" 92 1/4" 92 1/2" 92 3/4" 93" 93 1/4" 93 1/2" 93 3/4" 94" 94 1/4" 94 1/2" 94 3/4" 95" 95 1/4" 95 1/2" 95 3/4" 96" 96 1/4" 96 1/2" 96 3/4" 97" 97 1/4" 97 1/2" 97 3/4" 98" 98 1/4" 98 1/2" 98 3/4" 99" 99 1/4" 99 1/2" 99 3/4" 100" 100 1/4" 100 1/2" 100 3/4" PDP-11 SPECIALS 11/00 \$2,500 11/02 \$2,500 11/04 \$2,500 11/06 \$2,500 11/08 \$2,500 11/10 \$2,500 11/12 \$2,500 11/14 \$2,500 11/16 \$2,500 11/18 \$2,500 11/20 \$2,500 11/22 \$2,500 11/24 \$2,500 11/26 \$2,500 11/28 \$2,500 11/30 \$2,500 12/01 \$2,500 12/02 \$2,500 12/03 \$2,500 12/04 \$2,500 12/05 \$2,500 12/06 \$2,500 12/07 \$2,500 12/08 \$2,500 12/09 \$2,500 12/10 \$2,500 12/11 \$2,500 12/12 \$2,500 12/13 \$2,500 12/14 \$2,500 12/15 \$2,500 12/16 \$2,500 12/17 \$2,500 12/18 \$2,500 12/19 \$2,500 12/20 \$2,500 12/21 \$2,500 12/22 \$2,500 12/23 \$2,500 12/24 \$2,500 12/25 \$2,500 12/26 \$2,500 12/27 \$2,500 12/28 \$2,500 12/29 \$2,500 12/30 \$2,500 12/31 \$2,500	FOR SALE Printer set: 1403 R1 UCS SN 38011 1403 R1 UCS SN 32552 2821-3 UCS SN 50751 Printers rebuilt in factory In 1965-1975 Write or call American Fund Raising Services 600 Winter Street Waltham MA 02154 (617) 880-2870 FOR SALE Desktop 6800 Desktop 6800 System with 128K, 2.25 MB Disk Drive, 512 LPM Printer, 80 CPS Printer, Auxiliary power supply, with 80 Disk Subsystem and Communication adapters. Control — Charles P. Smith, Jr. Computer Operations American Fundraising Association 600 Winter Street Waltham, MA 02154 (781) 880-2870	AVAILABLE SYSTEM 34'S C-23 10/12/79 E-35 (3) 1/18/80 E-35 (3) 3/21/80 E-35 3/28/80 Also several used systems! Kevin Kelly CIS Corp 800 MONY Plaza Syracuse, NY 13202 315-425-1900 Telex: 53-7435		
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30, 1979, for the acquisition of a video display terminal to connect

via a dedicated communications line to the SOLNET system.

Request for Proposal No. 489 due 3:30 P.M., October 30, 1979, for

the acquisition of a multiprogramming, time-sharing computer

system for research and instructional purposes.

Detailed specifications may be obtained from the COPA office.

The COPA reserves the right to reject any and all bids and pro-

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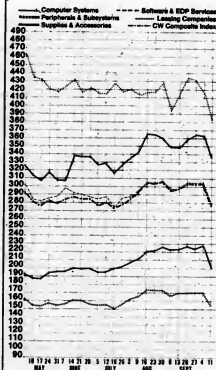
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CLOSING PRICES WEEK-TO-DATE OCTOBER 10, 1979

PRICE						PRICE						PRICE					
C	S	1979-79	CLOSE	WEEK	MAY	C	S	1979-79	CLOSE	WEEK	MAY	C	S	1979-79	CLOSE	WEEK	MAY
N		RANGE	OCT 10	CHANGE	PCT	N		RANGE	OCT 10	CHANGE	PCT	N		RANGE	OCT 10	CHANGE	PCT
COMPUTER SYSTEMS																	
A	ANDROS CORP.	17-60	17 3/8	+3 1/8	-19.2	A	ADVANCED CORP. TECH.	1-2	2 1/8	0	0.0	A	DATA ACCESS SYSTEMS	8-18	7 1/4	+5/8	+7.8
B	BOROUGHES CORP.	55-67	71 1/2	+1 1/2	-1.6	B	ANDROS CORP.	8-28	17 3/8	+3 1/8	-9.8	B	DATA PRODUCTS CORP.	12-25	18 1/2	+1	-5.7
C	COMPUTER AUTOMATION	11-44	11 1/8	+2 1/8	-1.6	C	APPLIED DATA INC.	8-17	8 1/2	-1 1/8	-18.8	C	DATA INC.	2-8	3 1/4	+1/8	-18.5
D	COMPUTER DATA CORP.	22-51	31 1/2	+7 1/8	-18.8	D	ARISTARQUE INC.	8-19	12 1/2	-1 1/8	-16.1	D	DECISION DATA COMPUT	2-8	2	+2	-11.1
E	COMPUTER RESEARCH INC.	8-45	31 1/2	+7 1/8	-18.8	E	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	E	DATA DATA SYSTEMS	10-12	11 1/2	+1/8	-1.8
F	DATA GENERAL CORP.	36-68	61 3/4	+3 1/4	-2.8	F	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	F	DECISION DATA	8-10	18 1/2	+2 1/8	-18.8
G	ELECTRONIC ASSOC.	19-34	34 1/2	+1 1/2	-1.6	G	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	G	DATA DATA SYSTEMS	10-12	11 1/2	+1/8	-1.8
H	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	H	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	H	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
I	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	I	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	I	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
J	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	J	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	J	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
K	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	K	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	K	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
L	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	L	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	L	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
M	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	M	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	M	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
N	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	N	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	N	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
O	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	O	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	O	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
P	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	P	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	P	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Q	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	Q	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Q	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
R	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	R	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	R	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
S	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	S	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	S	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
T	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	T	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	T	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
U	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	U	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	U	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
V	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	V	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	V	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
W	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	W	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	W	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
X	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	X	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	X	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Y	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	Y	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Y	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Z	ELECTRONIC EQUIPMENT	19-34	34 1/2	+1 1/2	-1.6	Z	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Z	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
SOFTWARE & EDP SERVICES																	
A	ADVANCED CORP. TECH.	1-2	2 1/8	0	0.0	A	ADVANCED CORP. TECH.	1-2	2 1/8	0	0.0	A	DATA ACCESS SYSTEMS	8-18	7 1/4	+5/8	+7.8
B	ANDROS CORP.	8-28	17 3/8	+3 1/8	-9.8	B	ANDROS CORP.	8-28	17 3/8	+3 1/8	-9.8	B	DATA PRODUCTS CORP.	12-25	18 1/2	+1	-5.7
C	APPLIED DATA INC.	8-17	8 1/2	-1 1/8	-18.8	C	APPLIED DATA INC.	8-17	8 1/2	-1 1/8	-18.8	C	DATA INC.	2-8	3 1/4	+1/8	-18.5
D	ARISTARQUE INC.	8-19	12 1/2	-1 1/8	-16.1	D	ARISTARQUE INC.	8-19	12 1/2	-1 1/8	-16.1	D	DECISION DATA COMPUT	2-8	2	+2	-11.1
E	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	E	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	E	DATA DATA SYSTEMS	10-12	11 1/2	+1/8	-1.8
F	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	F	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	F	DECISION DATA	8-10	18 1/2	+2 1/8	-18.8
G	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	G	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	G	DATA DATA SYSTEMS	10-12	11 1/2	+1/8	-1.8
H	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	H	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	H	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
I	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	I	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	I	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
J	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	J	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	J	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
K	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	K	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	K	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
L	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	L	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	L	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
M	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	M	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	M	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
N	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	N	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	N	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
O	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	O	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	O	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
P	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	P	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	P	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Q	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Q	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Q	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
R	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	R	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	R	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
S	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	S	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	S	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
T	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	T	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	T	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
U	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	U	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	U	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
V	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	V	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	V	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
W	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	W	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	W	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
X	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	X	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	X	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Y	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Y	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Y	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Z	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Z	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Z	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
PERIPHERALS & SUBSYSTEMS																	
A	ADVANCED CORP. TECH.	1-2	2 1/8	0	0.0	A	ADVANCED CORP. TECH.	1-2	2 1/8	0	0.0	A	DATA ACCESS SYSTEMS	8-18	7 1/4	+5/8	+7.8
B	ANDROS CORP.	8-28	17 3/8	+3 1/8	-9.8	B	ANDROS CORP.	8-28	17 3/8	+3 1/8	-9.8	B	DATA PRODUCTS CORP.	12-25	18 1/2	+1	-5.7
C	APPLIED DATA INC.	8-17	8 1/2	-1 1/8	-18.8	C	APPLIED DATA INC.	8-17	8 1/2	-1 1/8	-18.8	C	DATA INC.	2-8	3 1/4	+1/8	-18.5
D	ARISTARQUE INC.	8-19	12 1/2	-1 1/8	-16.1	D	ARISTARQUE INC.	8-19	12 1/2	-1 1/8	-16.1	D	DECISION DATA COMPUT	2-8	2	+2	-11.1
E	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	E	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	E	DATA DATA SYSTEMS	10-12	11 1/2	+1/8	-1.8
F	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	F	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	F	DECISION DATA	8-10	18 1/2	+2 1/8	-18.8
G	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	G	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	G	DATA DATA SYSTEMS	10-12	11 1/2	+1/8	-1.8
H	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	H	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	H	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
I	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	I	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	I	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
J	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	J	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	J	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
K	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	K	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	K	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
L	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	L	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	L	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
M	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	M	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	M	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
N	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	N	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	N	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
O	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	O	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	O	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
P	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	P	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	P	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
Q	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Q	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	Q	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
R	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	R	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	R	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
S	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	S	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	S	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
T	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	T	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	T	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
U	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	U	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	U	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
V	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	V	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	V	ELECTRONIC & N	3-9	2 3/8	+1/8	-3.5
W	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	W	COMPUTER NETWORK	8-19	12 1/2	-1 1/8	-16.1	W	ELECTRONIC & N	3-9	2 3/8	+1/8	

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